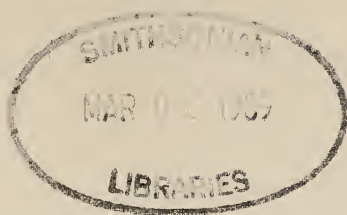


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ANNALS

OF THE SOUTH AFRICAN
MUSEUM

CAPE TOWN



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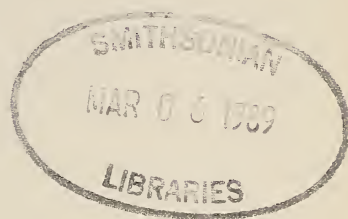
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(continued inside back cover)

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THE SOUTH AFRICAN MUSEUM'S
MEIRING NAUDE CRUISES
PART 17. PYCNOGONIDA

By
FRANÇOISE ARNAUD
&
C. ALLAN CHILD

Cape Town

Kaapstad

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THE SOUTH AFRICAN MUSEUM'S MEIRING NAUDE CRUISES

PART 17. PYCNOGONIDA

By

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Smithsonian Institution, Washington, D.C. 20560, USA

(With 14 figures)

[MS accepted 27 May 1987]

ABSTRACT

Thirty-nine species of Pycnogonida collected off the east coast of South Africa are recorded. One new genus, *Safropallene* (family Callipallenidae) and the following 13 new species are described: *Pantopipetta armata*, *Pantopipetta bilobata*, *Callipallene africana*, *Parapallene invertichelata*, *Safropallene longimana*, *Hedgpethia magnirostris*, *Nymphon barnardi*, *Nymphon bicornum*, *Nymphon granulatatum*, *Nymphon obesum*, *Nymphon paralobatum*, *Nymphon pedunculatum*, and *Nymphon serratidentatum*.

A brief discussion of the distribution and zoogeography of the pycnogonids collected by the R.V. *Meiring Naude* indicates the presence of a considerable endemic pycnogonid fauna on the continental shelf and slope of the east coast of South Africa.

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INTRODUCTION

The paper deals with the pycnogonids taken during four cruises by the South African Museum on R.V. *Meiring Naude* in 1976, 1977, 1978 and 1979. No pycnogonids have come to light from the 1975 cruise. The specimens

originate from continental shelf and slope localities from just south of the Mozambique–South African border to the East London area and from depths of 80 to 1 300 m. For full station data as well as background information on the cruises the reader is referred to Louw (1977, 1980).

All specimens are deposited in the South African Museum, Cape Town, under SAM–A catalogue numbers, except for a few surplus or duplicate lots of material deposited in the U.S. National Museum of Natural History (USNM), Washington, and the Museum National d'Histoire Naturelle (MNHN), Paris.

SPECIES LIST

Material unidentified at species level is either damaged or immature.

	SM Station					
	no.	ovig.	♂♂	gravid ♀♀	♀♀	juv.
Family Ammotheidae						
<i>Ammothella setacea</i> (Helfer)	86	—	4	—	6	4
	103	—	3	—	1	—
	129	—	(93 ♂♂, ♀♀, juvs.)			
	151	—	—	—	1	—
	163	—	3	—	1	1
	226	—	(110 ♂♂, ♀♀, juvs.)			
	232	—	14	—	3	1
	236	—	4	—	1	—
	250	—	—	—	1	—
<i>Ascorhynchus ornatum</i> (Helfer)	163	—	—	—	1	—
<i>Boehmia tuberosa</i> Möbius	233	—	1	—	—	—
<i>Cilunculus sewelli</i> Calman	185	—	—	—	—	3
	226	—	—	—	—	1
<i>Tanystylum thermophilum</i> (Barnard)	250	—	2	—	—	—
Family Phoxichilidiidae						
<i>Anoplodactylus typhlops</i> Sars	123	—	1	—	—	—
Family Austrodecidae						
<i>Pantopipetta armata</i> sp. nov.	103	—	4	—	1	—
	109	—	—	—	1	—
<i>Pantopipetta bilobata</i> sp. nov.	86	—	1	—	1	—
	163	1	—	—	4	—
	164	—	—	—	1	—
	250	—	1	—	5	—
Family Callipallenidae						
<i>Callipallene phantoma</i> (Dohrn)	129	1	—	—	—	—
<i>Callipallene africana</i> sp. nov.	226	—	3	—	—	—
	250	—	—	—	1	—
<i>Callipallene</i> sp.	163	1	—	—	—	—
	185	—	—	—	1	—
<i>Pallenopsis capensis</i> Barnard	185	—	1	—	1	—
<i>Pallenopsis longirostris</i> Wilson	107	—	1	—	1	—
<i>Pallenoides</i> sp.	185	—	—	—	—	1
<i>Parapallene algoae</i> Barnard	86	—	—	—	1	—
<i>Parapallene invertichelata</i> sp. nov.	86	1	—	—	2	3
<i>Pseudopallene gilchristi</i> Flynn	226	1	—	—	—	—
<i>Safropallene longimana</i> gen. et sp. nov.	129	—	(21 ♂♂, ♀♀)			—
	226	—	12	—	15	2

	SM Station					
	no.	ovig. ♂♂	♂♂	gravid ♀♀	♀♀	juv.
Family Pycnogonidae						
<i>Pycnogonum (Nulloviger) africanum</i>						
Calman	162	—	1	—	—	—
	232	—	—	—	1	—
<i>Pycnogonum crassirostrum</i> Sars	232	—	1	—	—	—
<i>Pycnogonum forte</i> Flynn	185	—	—	—	1	—
	226	—	—	—	1	1
<i>Pycnogonum nodulosum</i> Dohrn	86	—	—	—	2	—
	250	—	—	—	3	—
Family Colossendeidae						
<i>Hedgpethia magnirostris</i> sp. nov.	103	—	1	1	—	—
<i>Hedgpethia</i> sp.	226	—	—	—	—	1
<i>Rhopalorhynchus gracillimus</i> Carpenter	164	—	—	—	1	—
Family Nymphonidae						
<i>Nymphon barnardi</i> sp. nov.	250	—	—	—	2	—
<i>Nymphon bicornum</i> sp. nov.	60	—	1	—	—	—
	129	—	—	—	2	2*
<i>Nymphon comes</i> Flynn	179	—	—	—	1	—
	233	—	1	—	—	—
<i>Nymphon crenatiunguis</i> Barnard	179	—	1	—	—	—
	250	—	—	—	1	—
<i>Nymphon distensum</i> Möbius	86	—	2	—	2	—
	179	1	—	—	1	—
	185	1	—	1	1	3
	232	—	1	—	—	—
<i>Nymphon granulatum</i> sp. nov.	129	—	—	—	1	—
	162	—	3	—	1	—
	226	—	1	—	3	—
	232	—	—	—	1	3
	236	—	—	—	1	1
<i>Nymphon microctenatus</i> Barnard	237	—	—	1	—	—
<i>Nymphon modestum</i> Stock	86	1	1	—	—	—
	239	—	—	1	—	—
	250	—	3	—	1	7
<i>Nymphon obesum</i> sp. nov.	179	—	—	—	1	—
<i>Nymphon parabolatum</i> sp. nov.	226	—	—	—	1	—
<i>Nymphon pedunculatum</i> sp. nov.	163	2	1	—	—	1
	164	—	—	—	3	—
<i>Nymphon phasmatodes</i> Böhm	180	—	—	—	1	—
	185	—	—	—	1	1
<i>Nymphon pilosum</i> Möbius	86	6	3	—	4	5
	103	2	1	4	—	3
	129	—	1	—	—	—
	226	—	—	—	1	—
	250	—	1	—	2	—
<i>Nymphon serratidentatum</i> sp. nov.	226	—	1	—	1	1
<i>Nymphon</i> sp.	185	—	—	—	—	1
	250	—	—	—	—	1

SYSTEMATIC ACCOUNT

Family **Ammotheidae** Dohrn, 1881*Ammothella* Verrill, 1900*Ammothella setacea* (Helfer, 1938)

Fig. 1

Kyphomia setacea Helfer, 1938: 179–181, fig. 9A–C. Barnard, 1954: 144, fig. 28A.*Ammothella setacea* Stock, 1953a: 41; 1954: 118 (text), 120 (key).*Material*

Transkei area. Neotype, SAM–A10221, SM 226, 32°28,6'S 28°58,8'E, 710–775 m, 1 ovigerous ♂. Paraneotype, SAM–A10220, SM 226, 1 gravid ♀. SAM–A10240, SM 226, 104 ♂♂, ♀♀. USNM 216758, SM 226, 2 ♂♂, 2 ♀♀. MNHN–Py 593, SM 226, 1 ♂, 1 ♀. SAM–A10241, SM 232, 620–560 m, 14 ♂♂, 3 ♀♀, 1 juv. SAM–A10222, SM 236, 670–660 m, 4 ♂♂, 1 ♀. SAM–A10242, SM 250, 150–200 m, 1 ♀.

Zululand area. SAM–A10236, SM 86, 550 m, 4 ♂♂, 6 ♀♀, 4 juv. SAM–A10219, SM 103, 680 m, 3 ♂♂, 1 ♀.

Durban area. SAM–A10237, SM 129, 850 m, 93 ♂♂, ♀♀. SAM–A10238, SM 151, 900 m, 1 ♀.

East London area. SAM–A10239, SM 163, 90 m, 2 ♂♂, 1 ♀, 1 juv. F. Arnaud's collection, 1 ♂, SM 163.

Redescription

Male. Trunk fairly slender, first anterior segmentation line present, second usually absent, third lacking. Lateral processes long, separated by their diameters or slightly less proximally, armed with three long dorsodistal slender tubercles, except for the posterior pair which have two, and two laterodistal long spines. The longest tubercle measures over twice diameter of lateral process. Trunk armed with single anterolateral slender tubercle as long as chelifore basal diameter. Ocular tubercle very long, slender, eyes at distal swollen tip, slightly pigmented; tubercle armed with one, two, or three posterior pointing slender tubercles of varying lengths, but some specimens without posterior tubercles. Proboscis moderately inflated, without constrictions, lips almost flat. Abdomen typical of genus, long, with ventral bend in posterior half, armed with set of extremely variable dorsal tubercles consisting of from two to six single or double slender tubercles equal to and in varying lengths as the lateral process tubercles, and a pair of distal setae.

Chelifore slender, flaring distally, not as long as proboscis, the first segment armed with slender distal tubercle, the longer second segment with variable number (4–7) of similar dorsal tubercles and several long and short distal setae. Chela vestigial, without fingers, sometimes everted, sometimes extended beyond chelifore distal cup. Chela armed with single seta.

Palp typical of genus, distal five segments subequal, armed with many ventral and lateral setae slightly longer than each segment diameter.

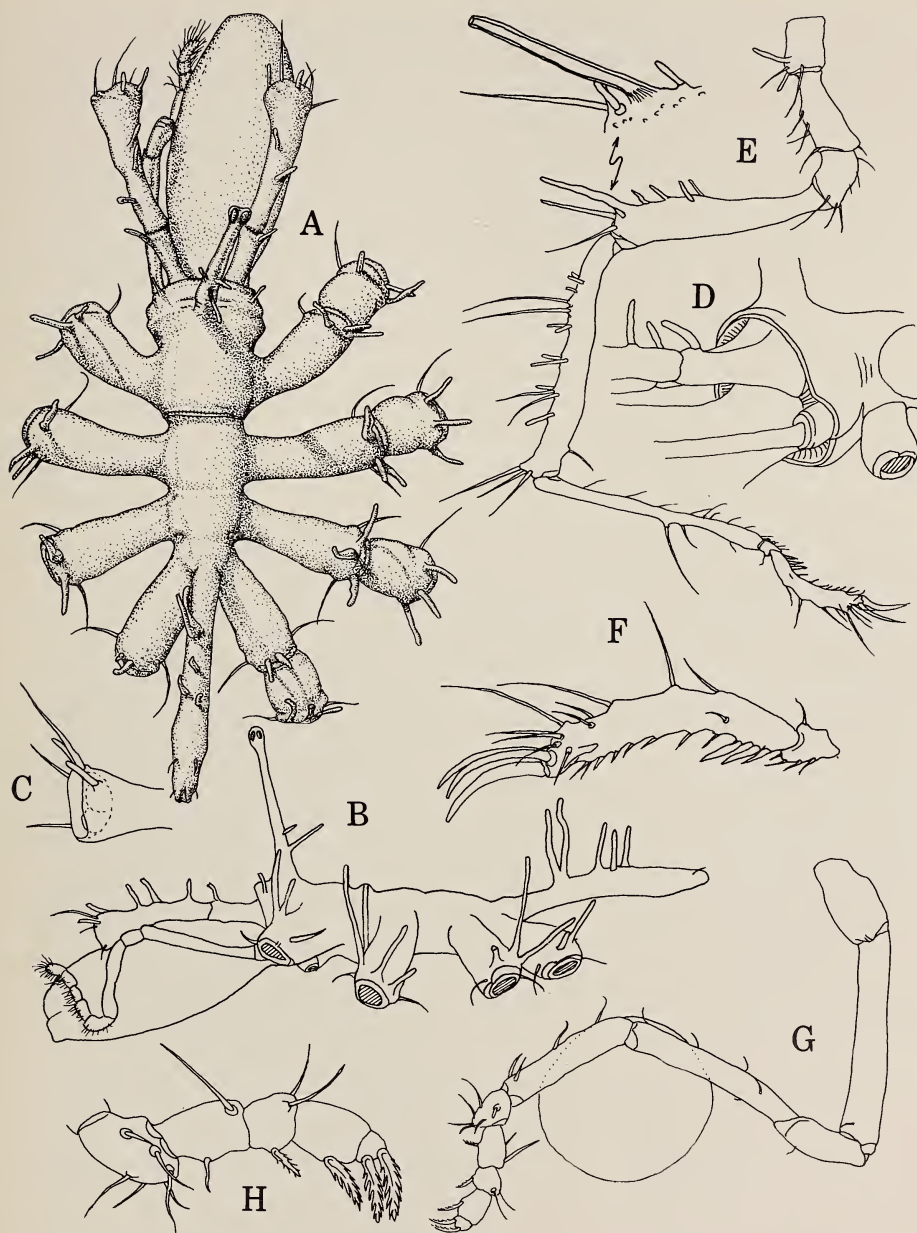


Fig. 1. *Ammothella setacea* (Helfer), male. A. Trunk, dorsal view. B. Trunk, lateral view. C. Chelifore tip. D. Trunk anterior, oblique lateral view. E. Third leg, with enlargement of cement-gland tube. F. Distal segments of third leg. G. Oviger with egg attached. H. Strigilis segments of oviger.

Oviger also typical, with second segment longest. Distal four segments each armed with one denticulate spine, except terminal segment with two. Spines with five or six serrations per side. Egg larger than for others of genus, equal in diameter to length of fourth segment.

Leg very slender, armed with long dorsal and lateral spines equal to or longer than segment diameters and dorsal blunt spines equal to or shorter than segments. Femoral cement-gland tube very long, dorsodistal, carried at low angle. Tarsus extremely short, propodus long, slender, armed with few long dorsal setae, three slender heel spines, and from seven to ten short sole spines. Claw slender, less than half propodal length, auxiliaries very slender, almost as long as main claw.

Proboscis, chelifores and palps originating in an anterior trunk concavity, slightly similar to that found in the genus *Cilunculus*.

Female. Slightly larger in all measurements except for oviger, which is reduced in size with a fourth segment of reduced length. Posterior trunk segmentation lines present or absent. Tubercles on chelifore and on lateral trunk shorter, as are those of lateral processes and abdomen.

Previous record

Agulhas Bank, 126 m.

Remarks

This species was described from a single female specimen and the above records apparently constitute only the second time this species has been taken. The type specimen was evidently lost during wartime (Stock 1953a: 41), so we have designated a neotype and a paraneotype from this large collection. This heretofore enigmatic species appears to have some characters of the closely related genus *Cilunculus*. The accompanying figures reveal several characters not illustrated by Helfer (1938). The proboscis, chelifore and palpi originate in a cephalic segment 'hood' typical of *Cilunculus* species, but this species has the longer chelifores of two segments, long tubular spines and general habitus of the genus *Ammothella*. The differences cited in the literature for *Cilunculus* are this cephalic hood, shorter chelifores of one or two segments, usually long pointed spines on the appendages, and a femoral gland showing as a long conical outgrowth of the femur. The genus *Ammothella* usually lacks the cephalic hood, has chelifores usually as long as the proboscis, long hollow clubbed or tubular spines, and an articulated distal tube as the emergent part of the femoral gland. These characters are mixed in *A. setacea*. Among the known species of both genera there are exceptions to every character used to diagnose the two. *Cilunculus* has usually been characterized by short chelifores but one species, *C. acanthus*, has two-segmented chelifores almost as long as the proboscis. On the other hand, several species of *Ammothella* (*A. tubicen*, *A. thetidis*, and others) display an ocular segment anterior extension suggestive of a hood, and two other genera, *Boehmia* and *Oorhynchus*, have projecting cephalic collars or

hoods over the chelifore insertion. The number of scape segments is not diagnostic for *Cilunculus*, but all known *Ammothella* species have long two-segmented scapes. *Cilunculus* has eight known species with two-segmented scapes and seven with a single segment. The cement glands of *Ammothella* species are characterized as tubes that are sometimes articulated, but at least two species (again *A. tubicen* and *A. thetidis*) have what appear to be long conical gland tubes, which have no articulation with the femur. The cement glands of *Cilunculus* are not known to be articulated but appear similar to those *Ammothella* species mentioned. This leaves the long tubular spines of *Ammothella* as a character not known to be shared by *Cilunculus*. If all *Ammothella* species had tubular blunt spines, the character might serve as diagnostic for the genus, but less than half of the known species have these spines. The remainder have long (sometimes only short) pointed spines, to all appearances the same as those on species of *Cilunculus*. Therefore, spine type cannot be a valid diagnostic character of *Ammothella*. At least one other genus, *Eurycyde*, has species with similar hollow blunt spines.

Cilunculus is known for its deep-water species and indeed, most are found in waters deeper than 100 m. There are exceptions to this aspect also. *Cilunculus australiensis* has a known depth range of 40–70 m and *C. cactoides* has been taken in as little as 38 m (unpublished National Museum of Natural History specimens). *Cilunculus* species have never been found in the littoral, whereas *Ammothella* is usually a littoral genus, but *A. profunda* was taken in over 1 000 m. This species was found to have a cephalic hood and was recently moved to *Cilunculus* (Nakamura & Child 1983: 32).

We believe, in spite of the evidence presented here, that the two genera should be kept separate for now. The differences remain, even with exceptions, and those of the tubular blunt spines, shallow- versus deeper-water habitats, predominantly short chelifores, and hooded cephalic segment continue to be sufficient evidence, in our opinion, to arrange the species in two separate genera.

Distribution

Extended considerably from Agulhas Bank to Transkei coast, in depths from 90 to 900 m.

Genus *Ascorhynchus* Sars, 1877

Ascorhynchus ornatum (Helfer, 1938)

Ainigma ornatum Helfer, 1938: 181, fig. 10a–f. Barnard, 1954: 144, fig. 28B.

Ascorhynchus ornatum Stock, 1953a: 41, 43–44, fig. 6; 1953b: 304 [key].

Material

East London area. SAM–A19597, SM 163, 90 m, 1 ♀.

Remarks

This is apparently only the fourth specimen and second capture recorded for this species. The types consist of a male and two females from the Agulhas

Bank, and the sexual characters of the male have not been described. From an unreported male collected south-west of the Cape of Good Hope in 708 m in the National Museum of Natural History collections, the following sexual characters are noted. The cement-gland pores appear to be a series of 6–8 tiny cups in a single row along the dorsal surface of the femur. The cement gland itself is not discernible in this young male Cape specimen. The ovigers are very similar in both sexes with the major segments of the male not much longer than those of the female. The strigilis terminal claw is slender, with no serrations, and is longer than the terminal segment. Sexual pores are very indistinct on the fourth legs, second coxae of the male. Stock (1953a: 41) is correct in stating that this is a highly characteristic, easily recognizable species. It should be noted that, in the two specimens examined, neither has eyes on the tall blunt ocular tubercle.

Distribution

This is an apparently endemic South African species and the Cape of Good Hope specimen is from the deepest known locality.

Genus *Boehmia* Hoek, 1881

Boehmia tuberosa Möbius, 1902

Fig. 3H

Böhmia tuberosa Möbius, 1902: 189–190, pl. 28 (figs 13, 14). Schimkewitsch, 1909: 3–4, figs 1B, D. Barnard, 1954: 136–137, fig. 23.

Böhmia spinosa Möbius, 1902: 190 [*lapsus calami*].

Boehmia tuberosa: Stock, 1957: 96 [text]; 1962: 278.

Material

Transkei area. USNM 216759, SM 233, 540–580 m, 1 ♂.

Remarks

This species had been described as smaller than *Boehmia chelata*, but both species should be on hand for this comparison to be relevant. It is easier to differentiate between the males of the two species than to identify isolated females. The male cement-gland area of *B. tuberosa* consists of a smooth or slick patch in an otherwise papillose and setose femur dorsum, and contains two rows of tiny transverse slits (Barnard 1954, fig. 23). The gland area covers the proximal half or two-thirds of the femur. The gland area of *B. chelata* is shorter, broader and has an uneven row of tiny circular pores in place of the slits present in *B. tuberosa*.

The palps of the three known species of this endemic genus have seven or eight segments. *Boehmia longirostris* (known only from a female) has seven palp segments, while *B. chelata* and *B. tuberosa* have eight—the short basal segment of these having been unnoticed by previous authors. A figure of the palp of *B. tuberosa* is provided (Fig. 3H). The terminal segment is shorter than the penultimate segment, and in the single specimen on hand, the two terminal

segments measure only half or a little less than the length of the fifth segment. Barnard (1954: 133) lists two other differences in his key. In *B. chelata* the femur is shorter, measuring only three or four times longer than its width, and the cephalic segment is parallel-sided or widens anteriorly. In *B. tuberosa* (the Meiring Naude specimen), the femur is slightly longer, being 4,2 times the width, and the cephalic segment narrows anteriorly. The cephalic segment anterior in *B. longirostris* is more or less parallel-sided, but the leg is not figured, nor are measurements given. The proboscis of the latter species is a longer tube than in the other two species and its lateral processes are spaced further apart.

Distribution

Of the few collecting records for *B. tuberosa*, the depth ranges from 11 m to 550 m, and it has been taken from off Cape Town and the Agulhas Bank to the East London area and now the Transkei area.

Through the courtesy of Dr G. Räck (Zoologisches Institut und Zoologisches Museum, Hamburg), we have been permitted to examine the holotype of *B. longirostris*. This is a smaller species than the two others of the genus. It is similar in habitus to *B. chelata*, but the following differences are evident: the legs decrease in length from anterior to posterior on the trunk; the three coxae are subequal in length with the second swollen with genital pores; the femur is about 1,5 times its width and bears many acute conical tubercles, each bearing a seta; the tibiae are shorter with tibia 2 slightly longer than tibia 1; the proboscis reaches 0,6 as long as the ventral trunk, while that of *B. chelata* is only half as long as the trunk; and the abdomen is articulated, carried ventrally and is square tipped. The following key is presented to help separate the three known species. There is controversy as to whether or not *B. dubia* Hedgpeth, known from a larva, is actually a member of this genus, and it is omitted from the key.

1. Legs about four times as long as body; cephalic segment narrow anteriorly; femur (δ) 4–5 times longer than broad *B. tuberosa*
- Legs not more than twice as long as body; cephalic segment parallel-sided or widened anteriorly; femur little more than twice as long as broad 2
2. Palp 7-segmented; proboscis length equals 0,6 of ventral trunk length *B. longirostris*
- Palp 8-segmented; proboscis length equals half of ventral trunk length *B. chelata*

Genus *Cilunculus* Loman, 1908

Cilunculus sewelli Calman, 1938

Cilunculus sewelli Calman, 1938: 161–163, figs 8–9. Clark, 1963: 75. Stock, 1968: 13.

Ammothella gigas Fage, 1956: 173–175, figs 9–14.

Material

East London area. SAM–A19607, SM 185, 90 m, 3 juvs.

Transkei area. SAM–A19608, SM 226, 710–775 m, 1 juv.

Remarks and distribution

There is nothing remarkable about the two sets of juveniles except for the great difference in their depths of capture. The 90 m at SM 185 marks the shallowest this species has ever been taken, but its wide depth range of 183–1 789 m easily permits the addition of shallower or deeper depths to the record. This species has been taken off the Natal coast, Zanzibar, and as far east as New Zealand.

Genus *Tanystylum* Miers, 1879*Tanystylum thermophilum* (Barnard, 1946)

Austroraptus thermophilus Barnard, 1946: 62; 1954: 146–148, figs 29–30.

Tanystylum thermophilum Stock, 1956: 92–93; 1957: 94–95, fig. 12; 1962: 277. Clark, 1977: 336.

Material

Transkei area. SAM–A19596, SM 250, 150–200 m, 2 ♂♂.

Remarks

These are typical males as figured by Barnard (1954, figs 29–30). The species has a six-segmented palp and a curved bottle-shaped proboscis, which makes it easy to distinguish.

Distribution

The maximum depth at this station off Transkei is the deepest at which this species has been taken (previously recorded from 11 m to a little over 100 m).

Family **Phoxichilidiidae** Sars, 1891Genus *Anoplodactylus* Wilson, 1878*Anoplodactylus typhlops* Sars, 1888

Anoplodactylus typhlops Sars, 1888: 341–342; 1891: 29, pl. 2 (fig. 3a–e). Hedgpeth, 1948: 228, 229, fig. 29a–c [literature]. Child, 1982a: 21.

Anoplodactylus neglectus Hoek, 1898: 293–295, figs 7–10.

Anoplodactylus pelagicus Flynn, 1928: 25–27, fig. 14a–b. Barnard, 1954: 128, fig. 19a–g.

non Anoplodactylus pelagicus Stock, 1981: 463–464, fig. 6.

Material

Durban area. SAM–A10223, SM 123, 690 m, 1 ♂.

Remarks

This male specimen closely resembles both *A. pelagicus* Flynn and *A. typhlops* Sars. The blind flattened ocular tubercle, the large gaping chelifores, the legs on which the cement-gland tube rises distally at 0,7 of the femur length, and the general habitus all conform to both descriptions. We believe they are inseparable and have little hesitation in synonymizing Flynn's species with Sars'.

We do not believe that Stock's nine specimens reported (as *A. pelagicus*) from campaign 'Walvis 1', station 75, 32°18,2'S 13°15,9'E, in 3 550 m, are this species. Stock (1981: 464, fig. 6a) illustrated three different acutely pointed ocular tubercles for Flynn's species, while the original description and figure stated 'the ocular tubercle is very low and flattened on top' (Flynn 1928: 25, fig. 14b). The oviger and legs of Stock's specimens are very close to this species, but the tall ocular tubercle is so unlike that of Flynn's and Sars' species descriptions that we believe the Walvis specimens may be another or new species.

There is a curious anomaly present in the *Meiring Naude* male. The cement-gland tubes are found only on the anterior three pairs of legs and not on the posterior pair. This specimen must be an adult as the sex pores appear ventrally on the second coxae of the posterior pair of legs. Perhaps the posterior legs were lost and then regenerated. The cement-gland duct joins the femur at a more obtuse angle (135°) than those shown by Flynn (1928, fig. 14a).

Distribution

This species, under its various names, is a deep-water blind species of wide distribution. It is known from the North and South Atlantic and its range extends into the Indian Ocean in the sub-Antarctic zone of Prince Edward and Crozet islands, and it has been taken in the Gulf of Alaska. Its depth range extends to over 3 600 m.

Family **Austrodecidae** Stock, 1954

Genus *Pantopipetta* Stock, 1963

Key to the genus *Pantopipetta*

1. Auxiliary claws present; eyes present 2
- Auxiliary claws lacking; eyes present, lacking, or not evident 3
2. With very tall spurs on lateral processes; auxiliary claws from 0,3 to 0,4 of main claw length *P. auxiliata*
- Without spurs or tubercles on lateral processes; auxiliary claws less than 0,3 main claw length *P. oculata*
3. Lateral processes without distal spurs or tubercles; palps with 4 distal segments; first coxae without spur; eyes lacking or not evident 4
- Lateral processes with tall or short spurs or low tubercles; palps with 3 or 4 distal segments; first coxae with or without spurs; eyes present, lacking, or not evident 6
4. Tarsus very short; tarsus-propodus length ratio 1 : 7; propodal claw without serrations *P. australis*
- Tarsus longer, tarsus-propodus length ratio from 1 : 1,5 to 1 : 2,5; propodal claw with or without serrations 5
5. Tarsus-propodus length ratio 1 : 2,5; palp segment 5 equal to terminal segment; propodal claw smooth (including *P. brevicauda*) *P. longituberculata*

- Tarsus-propodus length ratio 1 : 1,5; palp segment 5 distinctly longer than terminal segment; propodal claw endally serrate *P. weberi*
- 6. Palp with 3 short distal segments; eyes present or lacking 7
- Palp with 4 short distal segments; eyes lacking or not evident 10
- 7. Lateral processes with low rounded tubercles, not taller than wide; first coxae with 2 low slender tubercles; eyes lacking *P. aconae*
- Lateral processes with tall spurs or tubercles; first coxae with or without spurs or tubercles; eyes present or lacking 8
- 8. Lateral processes with low tubercle on first pair, tall spur on posterior 3 pairs; first coxae and femorae with broad rounded dorsal tubercles; eyes present *P. bilobata* sp. nov.
- All lateral processes with tall spurs; first coxae with or without tubercles or spurs; eyes lacking or not evident 9
- 9. First coxae with tall dorsal spur and shorter ventral spur, matching those of lateral processes *P. armata* sp. nov.
- First coxae without spurs or tubercles *P. armoricana*
- 10. Lateral processes with tall spurs on posterior 3 pairs only; propodal claws slightly serrate *P. capensis*
- Lateral processes with low inconspicuous tubercles; propodal claw smooth 11
- 11. Femur with large dorsodistal tubercle almost as long as segment diameter; tarsus-propodus length ratio 1 : 2,6; propodal claw shorter than tarsus *P. angusta*
- Femur with very low dorsodistal tubercle less than half segment diameter; tarsus-propodus length ratio 1 : 3,1; propodal claw longer than tarsus *P. lata*

Pantopipetta armata sp. nov.

Fig. 2

Material

Holotype, SAM-A19574, SM 103, 28°31,7'S 32°34,0'E, 680 m, 1 ♂. Paratypes, SAM-A19575, 1 ♂, 1 ♀. Paratype, USNM 228131, SM 103, 1 ♂. Paratype, MNHN-Py 591, SM 103, 1 ♂. Paratype, SAM-A19576, SM 109, 28°41,0'S 32°36,8'E, 1 300 m, 1 ♀.

Description

Male. Trunk completely segmented, including segmentation line at base of abdomen. Lateral processes long, widely separated, armed with long slender spur on first pair, slender spurs twice length of first pair on posterior three pairs, and shorter slender spurs on ventrodiscal lateral processes. Abdomen reaching to midlength of coxa 2 of fourth pair of legs, slender, cylindrical, glabrous. Proboscis slightly swollen proximally, tubular and annulated in distal two-thirds, almost as long as trunk, curved slightly ventrally. Palps seven-segmented,

second segment longest, fourth segment 0,6 of second segment length. Terminal three segments armed with ventral short setae, sixth segment twice length of fifth, seventh only a tiny knob.

Ocular tubercle a tall erect cone tapering to small distal bulb, without eyes.

Oviger 10-segmented, typical of genus. Strigilis segments increasingly smaller, armed with short broad denticulate spines in formula 3 : 2 : 2 : 3, with terminal claw only slightly larger than spines.

Legs long, slender, armed with few distal setae and long dorsodistal seta longer than segment diameter on major segments. First coxae with tall dorso-distal spur and short ventrodistal spur, third coxae with matching dorsodistal

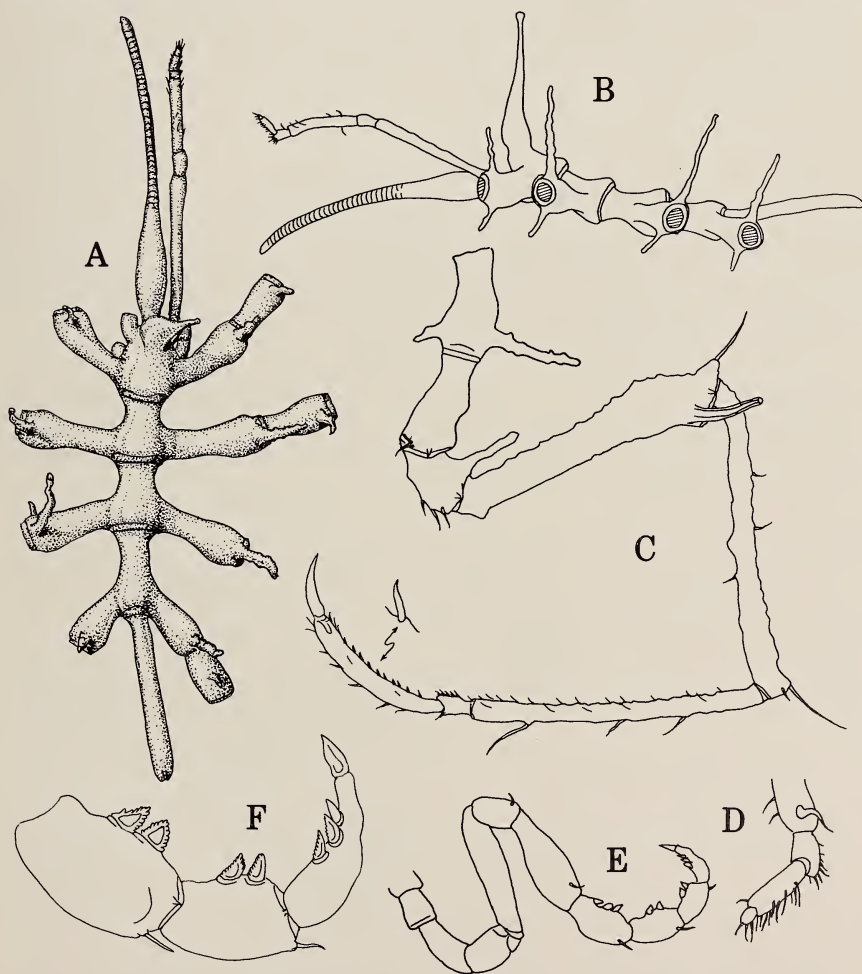


Fig. 2. *Pantopipetta armata* sp. nov. Holotype, male. A. Trunk, dorsal view. B. Trunk, lateral view. C. Third leg, with enlargement of sole spine. D. Distal segments of palp. E. Oviger. F. Distal segments of oviger.

spur. Cement-gland tube tapered, longer than femur diameter, placed distally on anterolateral or posterolateral surface and extending beyond flexed first tibia. Anterior or posterior gland placement random, without apparent pattern. Tarsus short, about 0,25 propodal length, both segments armed with row of short sole spines, few ectal setae. Claw 0,4 propodal length, auxiliary claws lacking. Femur and tibia 2 equal in length, tibia 1 slightly longer.

Female. Only slightly larger than male, except for oviger which is smaller, with fewer denticulate spines.

Measurements (holotype, in mm)

Trunk length, 1,66; trunk width (across 2nd lateral processes), 1,3; proboscis length, 1,54; abdomen, 0,84; third leg, coxa 1, 0,36; coxa 2, 0,35; coxa 3, 0,24; femur, 0,94; tibia 1, 0,98; tibia 2, 0,94; tarsus, 0,12; propodus, 0,49; claw, 0,2.

Remarks

Of the 12 known species of *Pantopipetta*, none has the slender spurs on both the dorsal and ventral surfaces of the lateral processes and first coxae. At least one other species (*P. capensis*) has reduced spurs on the first pair of lateral processes; others have no spurs but instead low tubercles (as in *P. bilobata*), but the presence of ventral spurs is sufficient to make this a new species.

Distribution

The stations at which these specimens were taken are on the Natal coast, between the St Lucia Estuary and Richards Bay, and this blind deep-water species was taken in 680 m and 1 300 m.

Etymology

The specific name '*armata*' refers to the unusual lateral process and first coxa armament of dorsal and ventral spurs.

Pantopipetta bilobata sp. nov.

Fig. 3A–G

Material

Transkei area. Holotype, SAM–A10256, SM 250, 31°59,3'S 29°22,5'E, 150–200 m, 1 ♂. Paratypes, SAM–A10260, SM 250, 4 ♀♀. Paratype, MNHN–Py 592, SM 250, 1 ♀.

Zululand area. Paratypes, SAM–A10259, SM 86, 27°59,5'S 32°40,8'E, 550 m, 1 ♂, 1 ♀.

East London area. Paratypes, SAM–A10257, SM 163, 33°04,6'S 28°06,6'E, 90 m, 3 ♀♀. Paratypes, USNM 228132, SM 163, 1 ♂, 1 ♀. Paratype, SAM–A10258, SM 164, 33°04,6'S 28°06,6'E, 90 m, 1 ♀.

Description

Male. Trunk completely segmented including abdomen base. Lateral processes moderately long, about twice their maximum diameter, separated by approximately their own diameters, armed with tiny low single or double tubercles on first pair, and very tall slender spurs on others. Without ventral armament. Tall slender spurs may be present only on posterior two pairs of lateral processes or only on posterior pair. Ocular tubercle tall, erect, tapering

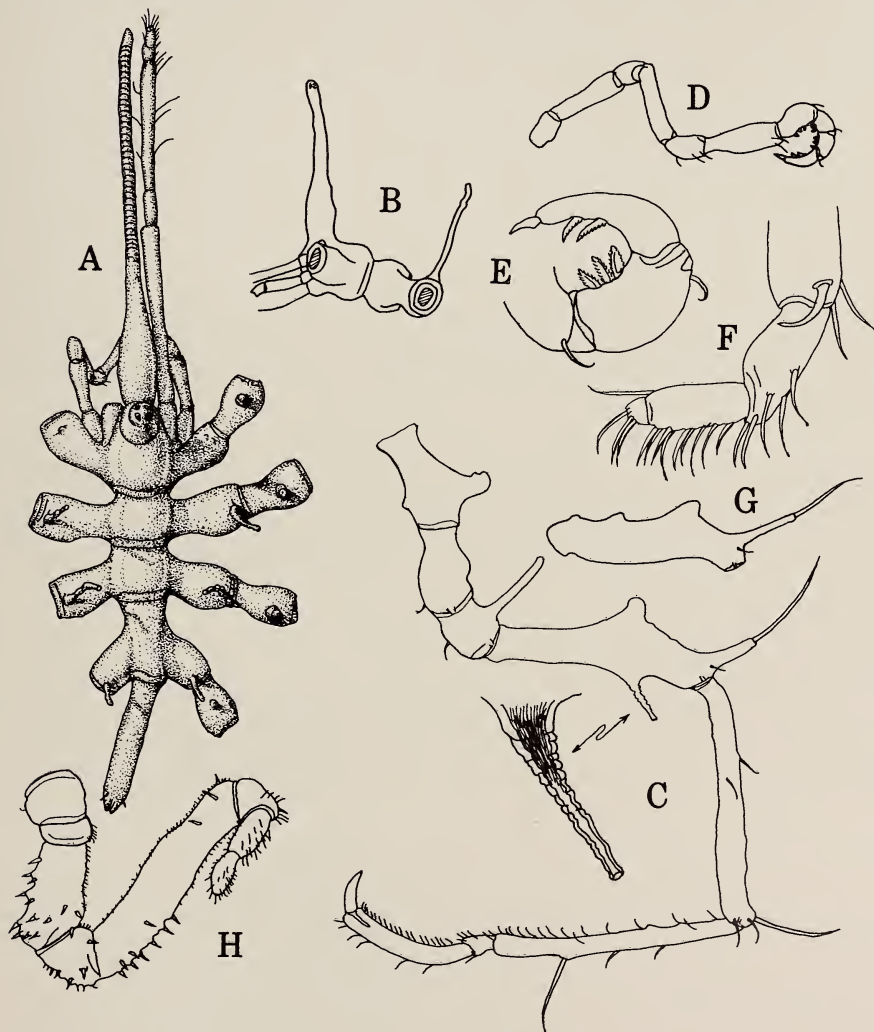


Fig. 3. A-G. *Pantopipetta bilobata* sp. nov. A-F. Holotype, male. A. Trunk, dorsal view. B. Trunk anterior, lateral view. C. Third leg, with enlargement of cement-gland tube. D. Ovipositor. E. Ovipositor distal segments. F. Distal palp segments. G. Paratype, female. Femur. H. *Boehmia tuberosa* Möbius. Palp.

to tiny eyes at tip. Proboscis typical of genus, swollen proximally, tubular and annulated distally, 0,25 longer than trunk length, down-curved distally. Abdomen moderately robust, cylindrical, extending to distal end of second coxae of fourth legs, armed with pair of short distal setae.

Palp seven-segmented, second longest, fourth 0,6 as long as second. Terminal three segments heavily setose ventrally, setae longer than segment diameters. Sixth segment slightly longer than fifth, seventh only a knob.

Oviger of typical recurved shape; second, fourth and sixth segments subequal. Strigilis segments of increasingly reduced size distally, armed with an ectal seta and endal denticulate spines in the formula 3 : 3 : 3 : 2, with terminal claw the same size as spines. Spines slender, margins closely serrate.

Legs long, slender, armed with few short setae and a very long spine dorso-distally on a femur tubercle as long as femur diameter and on single dorsodistal swellings on both tibiae. Femur with conical cement-gland tube ventrally along 0,6 of its length and large broad-based tubercle dorsally just opposite cement-gland tube. First coxae with large broad-based dorsodistal tubercle and tiny hint of a low tubercle on ventral side. Third coxae with tall slender dorsal tubercle or spur. Tarsus short, slightly over 0,2 propodal length, armed with few ventro-distal setae. Propodus slender, well curved, with few ectal setae and row of short sole spines. Claw robust, short, only slightly longer than tarsus, without serrations.

Female. Entire animal slightly larger than male except for oviger which is typically smaller. Femur distinctive from that of male. Dorsal surface with two broad low tubercles, the distal tubercle larger than the proximal one and dorso-distal slender tubercle bearing spine longer than in male, measuring 1,5 the segment diameter. Dorsal broad tubercles only on posterior four legs and absent from anterior two pairs.

Measurements (holotype, in mm)

Trunk length, 1,5; trunk width (2nd lateral processes), 1,25; proboscis length, 2,1; abdomen, 0,71; third leg, coxa 1, 0,41; coxa 2, 0,36; coxa 3, 0,21; femur, 0,96; tibia 1, 1,11; tibia 2, 1,06; tarsus, 0,12; propodus, 0,53; claw, 0,15.

Remarks

This species is characterized by the presence of eyes, lack of auxiliary claws, and by the curious variability of the tall lateral-process spurs occurring on the posterior six, or four, or only on the last pair of lateral processes. This latter character is not exactly unique among species of *Pantopipetta*, where at least two species lack tall spurs on the anterior pair of lateral processes, but no other species appears to have this 'diminishing' of spurs toward the anterior in some, but not all, specimens examined. Perhaps this is a sexual character related to maturity of the gonads, but many more specimens would have to be examined, including ovigerous specimens, in order to confirm this conjecture. This charac-

ter of 'gain' or 'loss' of tall spurs appears sufficient in our opinion to propose this as another new species of *Pantopipetta*.

In the twelve species of *Pantopipetta*, including the two new species described herein, there are only three with eyes (a few others are described in which the eyes are not evident and supposedly are lacking), while the majority (10) lack auxiliary claws. Besides this species, *P. auxiliata* and *P. oculata* have eyes, but the latter two have auxiliary claws whereas the new species lacks them. The majority of species have four short distal palp segments, except for four species—including *P. bilobata*—that have three segments. The other species with three short segments are *P. aconae*, *P. armoricana*, and *P. armata* (described herein, see pp. 132–134). *Pantopipetta bilobata* differs from *P. aconae*, which has low pointed lateral-process tubercles, paired tubercles on the first coxae, and other morphological differences. The other two species bear long slender tubercles of varying lengths on all eight lateral processes, have other tubercles where *P. bilobata* has none, and also lack eyes.

Distribution

This new species appears to be a typical element of the eastern warmer-water pycnogonid fauna of South Africa and has a rather wide geographic and bathymetric distribution from Zululand to East London in 90–550 m.

Etymology

This species name refers to the bilobed appearance of both the male femur, with a dorsal tubercle and opposed ventral cement-gland tube, and the female femur, with its twin dorsal tubercles.

Family **Callipallenidae** Hilton, 1942

Genus *Callipallene* Flynn, 1929

Callipallene phantoma (Dohrn, 1881)

Pallene phantoma Dohrn, 1881: 196–197, pl. 14 (figs 1–9).

Callipallene phantoma Child, 1982a: 26–27 [literature]. Arnaud, 1987: 49.

Material

Durban area. SAM–A10225, SM 129, 850 m, 1 ♂ with larvae.

Remarks

This specimen possesses the typical habitus of the species, the long neck, long legs with few spines, and straight propodus without a heel, but with long auxiliary claws measuring over half the main claw. The auxiliaries of this specimen have basal denticulation like those figured for *C. panamensis* Child, 1979 (fig. 14e), and the proboscis is less angular than that of Mediterranean specimens.

Measurements (in mm) of the third right leg of this specimen are: coxa 1, 0,16; coxa 2, 1,23; coxa 3, 0,26; femur, 1,95; tibia 1, 1,77; tibia 2, 2,43; tarsus, 0,05; propodus, 0,51; claw, 0,34; auxiliaries, 0,25.

Distribution

This species is distributed from the Mediterranean to New England, Florida, the Bahamas and Japan. It is a new record for the Indian Ocean off South Africa and was taken at a surprising depth of 850 m. Other known collecting depths are much shallower (3 m from *Sargassum linifolium*—Krapp-Schickel & Krapp 1975, and from 10 to 35 m in Marseille Gulf, from *Posidonia oceanica* blades—Arnaud 1987: 49).

Callipallene africana sp. nov.

Fig. 4

Material

Transkei area. Holotype, SAM-A10226, SM 226, 32°28,6'S 28°58,8'E, 710–775 m, 1 ♂ (incomplete). Paratypes, SAM-A10217, SM 226, 710–775 m, 2 ♂♂ (damaged, without legs). Paratype, SAM-A10227, SM 250, 31°59,3'S 29°22,5'E, 150–200 m, 1 ♀ (damaged, 1 complete leg only).

Description

Male. Size moderately small, leg span 24,3 mm. Trunk completely segmented, lateral processes short, 1,5 times longer than their diameters or less, separated by slightly less than their diameters, glabrous. Neck moderately long, posterior parallel-sided part as long as anterior expanded part, or 'crop'. Oviger implantation well in front of first lateral processes, against posterior extremity of neck. Ocular tubercle low, blunt, as tall as diameter, with slender tubercle at apex not as tall as ocular tubercle itself. Eyes present, slightly pigmented. Abdomen short, blunt, semi-erect, glabrous. Proboscis short, not as long as neck, blunt, broad, without ventrodistal bulges, lips flat.

Chelifores massive, curved against proboscis anterior. Scape not as long as proboscis, slightly curved inward, armed with few lateral and distal setae. Chela broad, semiglobular, armed with fringe of setae before fingers. Fingers straight except at curved tips, armed with row of low crenulations.

Ovigers typical, third segment slightly elongate, fourth about 0,74 length of fifth, which has distal apophysis and row of six or seven ectal setae. Strigilis segments increasingly shorter distally, armed with monomorphic denticulate spines in the formula 12 : 11 : 11 : 12. Spines bear one or two broad proximolateral teeth and finely serrate distolateral edges. Distal spines longer than proximal spines. Legs missing.

Female. Trunk and appendages slightly larger than male, oviger fifth segment shorter, without distal apophysis.

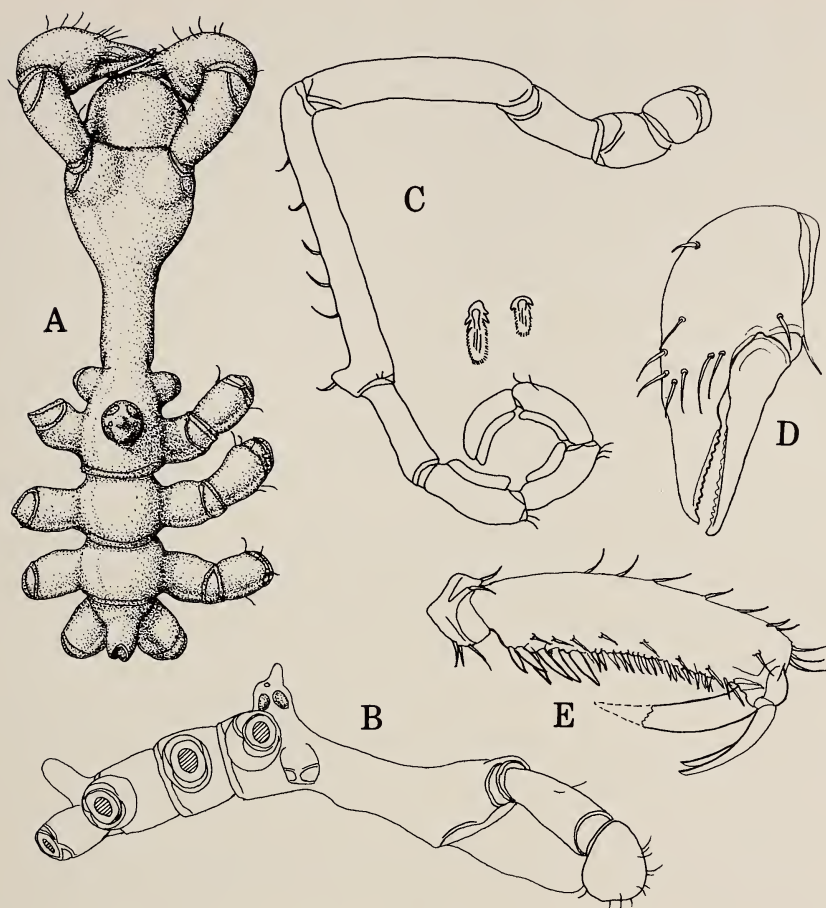


Fig. 4. *Callipallene africana* sp. nov. A-D. Holotype, male. A. Trunk, dorsal view. B. Trunk, lateral view. C. Oviger, with enlargements of proximal and distal denticulate spines. D. Chela. E. Paratype, female. Third leg, distal segments.

Legs elongate, armed with very few setae not as long as segment diameters. Femur and first tibia equal in length, second tibia about 0,2 longer. Propodus very slightly curved, without heel, armed with five or six heel spines arranged in two rows, many shorter sole spines flanked by row of short lateral setae. Claw moderately slender, slightly curved, auxiliaries about 0,6 main claw length.

Measurements (in mm)

Holotype, male: trunk length 2,22; trunk width, 0,92; proboscis length, 0,7; abdomen length, 0,23.

Paratype, female: leg—coxa 1, 0,32; coxa 2, 1,37; coxa 3, 0,46; femur, 2,76; tibia 1, 2,75; tibia 2, 3,37; tarsus, 0,12; propodus, 0,54; claw, broken.

Remarks

There are no long-necked species of the genus *Callipallene* known in southern African waters. We hesitate to describe this as a new species for lack of suitable undamaged material, but it is unlike anything known from the region. There are two species known from South Africa, *Callipallene vexator* Stock, 1956, and *Callipallene* sp. Barnard, 1954, each with sufficient differences as to prevent confusion with this new species.

The taxonomy of this genus is in a state of confusion and there also seems to be some evidence that neck length is a function of age (Stock 1952: 10, figs 25–27). *Callipallene phantoma* (Dohrn) and its controversial subspecies appear to be the nearest relatives of the new species, but they have longer necks, many more setae, different leg length ratios, and other characters that differ from this new species. They are also separated from the new species by vast geographical distances and, although this is never sufficient reason to name a new species, this is a contributing factor, in addition to the morphological differences, in naming this new species.

The combination of moderately long neck, five or six heel spines in two rows, lack of significant setae and spines on the legs, presence of chela finger serrations, and the compact trunk segments are sufficient, we believe, to describe this as a new species.

Distribution

Known only from the type locality, the Transkei area, in 710–775 m, and slightly to the north-east in 150–200 m.

Etymology

The specific name for this species is derived from the African continent, its place of origin.

Callipallene sp.*Material*

East London area. SAM-A10228, SM 163, 90 m, 1 ♂ with eggs. SAM-A10247, SM 185, 90 m, 1 ♀.

Remarks

These damaged specimens may represent a new species, but they share many characters with known species and are sufficiently damaged that we refrain from designating them either as known or new.

The trunk is either completely segmented or lacks the posterior suture between third and fourth segments. The lateral processes are compact, separated by less than their diameters and only slightly longer than their maximum diameters. The neck is short and the chelifores are robust and short. The palm

has many ectal setae and the fingers, about as long as the palm, have serrate teeth. The abdomen and proboscis are quite short and the proboscis has ventrodistal bulges.

The oviger is typical, with a large fifth segment apophysis in the male. The strigilis spines are alike and have the formula 10 : 8 : 8 : 10. The legs are robust, with few setae, the femur is subequal to tibia 1, and tibia 2 is longest. The propodus is very setose lateral to two distinct rows of sole and heel spines. There are four to six heel spines. The claw is short and the auxiliaries are over 0,7 as long as the claw. Both auxiliaries have endal rugosities or patches of tiny blunt spines numbering from five to eight.

These specimens share characters of *Callipallene belizae* Child, *C. pectinata* (Calman), *C. californiensis* Hall, and *C. emaciata* (Dohrn). The pectinate or rugose auxiliary claws do not appear on all specimens of the species bearing them (*C. pectinata*, *C. panamensis*, and possibly others). Therefore, it is not always a reliable taxonomic character in the genus.

This unnamed species is closest to *C. pectinata*, also its closest geographical associate. Although *C. pectinata* has much larger rugosities (even teeth) endally on the auxiliary claws, the leg and propodus are similar except for having fewer lateral propodal setae and a longer main claw. The neck and general trunk habitus are the same in both species, as are the ovigers and chelifores. It is possible that when more specimens of this species are taken from South African waters, it will be found that they conform more closely with *C. pectinata* and can be assigned to that species with more confidence.

Of the other species near these Meiring Naude specimens, *C. emaciata* and *C. belizae* have shorter propodi with less curvature and fewer lateral setae. Also, *C. belizae* lacks chelifore teeth and ventrodistal proboscis bulges. *Callipallene panamensis* has a much longer propodus with fewer setae and spines, while the propodus of *C. californiensis* has fewer lateral setae and auxiliary claw rugosities that appear more like tiny setae than the blunt spines of *Callipallene* sp.

These specimens are, of course, quite different from the two known South African species, *C. vexator* Stock, 1956, and *Callipallene* sp. Barnard, 1954.

Genus *Pallenopsis* Wilson, 1881

Pallenopsis capensis Barnard, 1946

Pallenopsis capensis Barnard, 1946: 62; 1954: 116 [key], 118–119. Stock, 1956: 83–84, fig. 7a; 1962: 285; 1983: 34.

Material

East London area. SAM–A10216, SM 185, 90 m, 1 ♂, 1 ♀.

Remarks

These two specimens agree well with *P. capensis* as described. They have the long auxiliaries, a few long spines, and a club-shaped sixth oviger segment

densely covered with minute spines or setae. The male of this species has a very short cement-gland tube opening ventrally, slightly proximal to the middle of each femur. The second left leg of the male measures 73 mm, whereas that of the female is smaller.

Distribution

This is a typical South African species, known from the Cape to East London area in 51–342 m.

Pallenopsis longirostris Wilson, 1881

Pallenopsis longirostris Wilson, 1881: 252–253, pl. 4 (figs 19–22), pl. 5 (figs 24–25). Hedgpeth, 1948: 210–211, fig. 21a–b [literature]. Arnaud, 1973: 150. Stock, 1981: 463, fig. 5a–f.
Pallenopsis oscitans: Barnard, 1954: 122, fig. 17.

Material

Zululand area. SAM–A10215, SM 107, 1 200–1 000 m, 1 ♂, 1 ♀.

Remarks

This is a large handsome species with well-pigmented eyes.

Distribution

It has a wide distribution, predominantly in the North Atlantic, but this appears to be the first record of it in the Indian Ocean. Barnard (1954: 122) recorded it from off Cape Point, so it is not surprising to find it off the coast of Zululand. It has a depth range of 135–3 065 m.

Genus *Pallenoides* Stock, 1951

Pallenoides sp. nr *amazonica* Stock

Compare:

Pallenoides amazonica Stock, 1975: 1012–1015, figs 23–24.

Material

East London area. SAM–A10218, SM 185, 90 m, 1 larva.

Remarks

Despite its young stage of development (its fourth legs are only pointed knobs), this specimen shares the main characters of an adult of *P. amazonica* as originally described. It has three trunk suture lines, a short proboscis with ventrodistal bulges, stout scapes and chelae with smooth movable fingers and very small crenulations on the immovable finger, a low conical ocular tubercle, a short angular abdomen, and robust legs. The anterior four legs are completely developed, whereas the posterior four are less developed to undeveloped. The eyes are not visible and the curved propodus has a heel with only two basal

spines and five shorter sole spines. The auxiliary claws are as long on the anterior legs as in the type of *P. amazonica*.

The larva measures 1,44 mm in trunk length and 0,63 mm across the second lateral processes.

It is possible that this specimen is either *P. proboscideum* Barnard, or *P. magnicollis* Stock, both known from the South African area (Algoa Bay and Lüderitz Bay respectively). However, it lacks the median trunk, lateral process and chelifore tubercles of *P. proboscideum*, and lacks the distal trunk setae and has a different shaped proboscis than *P. magnicollis*. It agrees more in the trunk, proboscis and leg characters with *P. amazonica* than with the two South African species. Stock's type was taken in northern Brazil, and although this Meiring Naude record is certainly questionable, it would not be the first time a pycnogonid species has such disparate distribution.

Genus *Parapallene* Carpenter, 1892

Parapallene algoae Barnard, 1946

Parapallene algoae Barnard, 1946: 61; 1954: 111–112, fig. 12a–c. Stock, 1956: 81–82, fig. 5a–e; 1962: 284.

Material

Zululand area. SAM–A10252, SM 86, 550 m, 1 ♀.

Remarks

This is a large, handsome, long-necked species and this specimen bears several orange or white ova in its distended femorae. The trunk length, from the base of the chelifores to the abdomen base, is 10,3 mm.

Distribution

This is apparently an endemic South African species, known from the south and east coasts in 55–159 m. This record extends the known range well into the Indian Ocean and, at 550 m, is from much deeper water.

Parapallene invertichelata sp. nov.

Fig. 5

Material

Zululand area. Holotype, SAM–A19572, SM 86, 27°59,5'S 32°40,8'E, 550 m, 1 larvigerous ♂. Paratypes, SAM–A19573, SM 86, 550 m, 2 ♀♀ (1 without legs), 1 juv., 2 larvae.

Description

Male. Size fairly small, leg span slightly greater than 21 mm. Slender species with long appendages. Trunk completely segmented, neck moderately

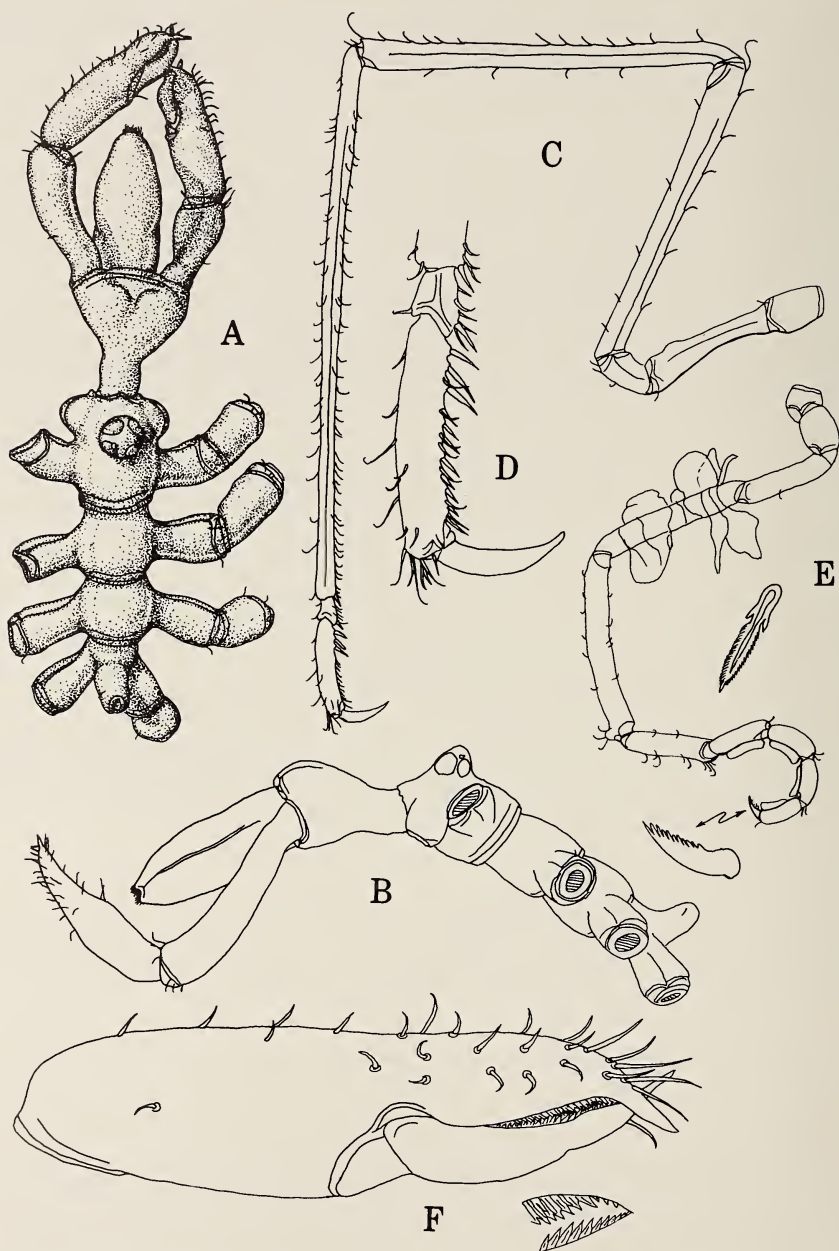


Fig. 5. *Parapallene invertichelata* sp. nov. Holotype, male. A. Trunk, dorsal view. B. Trunk, lateral view. C. Third leg. D. Distal segments of leg. E. Oviger, with enlargements of denticulate spine and terminal claw. F. Chela, with enlargement of teeth.

short, lateral processes separated by their own diameter or little more, as long as 1,5 times their maximum diameter, armed with short posterodistal seta on second and third pairs. Ocular tubercle short, not as tall as its diameter; eyes large, anterior pair larger than posterior pair, slightly pigmented. Abdomen short, erect, armed with pair of short distal setae. Proboscis slender, constricted in midregion, tapering distally to very small mouth bearing tightly packed fringe of oral setae.

Chelifores large, carried in inverted or inferior position, arching ventral to proboscis. Scape large, equal in length to proboscis, armed with several distal setae. Chela long, fingers shorter than palm. Fingers swollen for most of length, tapering to slender tips that cross when fingers close. Armed with many short setae on immovable finger only, and row of coalesced teeth similar to propodal lamina on both fingers.

Oviger moderately long, slender, third segment slightly longer than combined length of first two, fifth longest, 0,2 longer than fourth, armed with several lateral setae and low distal apophysis bearing three setae. Sixth through tenth segments progressively shorter, armed with few lateral and distal setae. Strigilis armed with denticulate spines in formula 16 : 15 : 14 : 13, spines slender, with pair of large basal serrations and many tiny serrations distally. Terminal claw short, about half length of terminal segment, well curved, armed with eleven short endal teeth.

Legs long, very slender, armed with short setae increasing in numbers distally. Second coxa slightly longer than first and third combined. Second tibia longest with first tibia and femur progressively shorter. Tarsus very short, armed with several ventral setae and single spine equal to ventrodistal spine on second tibia. Propodus very slightly curved, without heel, armed with three heel spines of equal length and row of eight or nine sole spines, which are flanked by rows of short lateral setae. Claw robust, moderately curved, half length of propodus. Auxiliary claws absent. Cement glands not evident.

Female. Sexual pores dilated on all second coxae, femorae with few ova. Trunk size almost matching male, equally or slightly less setose. Oviger segments four and five equal, fifth without setose distal apophysis.

Measurements (holotype, in mm)

Trunk length, 1,97; trunk width (2nd lateral processes), 0,93; proboscis length, 0,76; abdomen, 0,2; third leg—coxa 1, 0,29; coxa 2, 0,78; coxa 3, 0,36; femur, 2,0; tibia 1, 2,23; tibia 2, 3,37; tarsus, 0,16; propodus, 0,6; claw, 0,3.

Remarks

This new species shares characters of both *Parapallene* and *Pseudopallene* and, indeed, there is little to differentiate the two genera (Stock 1953b: 296–297; 1954: 50). Without wishing to undertake an analysis of both genera, we propose this new species as belonging to *Parapallene*. Its proboscis is very much like that of *Pseudopallene hospitalis* (Loman) (formerly *Parapallene*

hospitalis). One of the few differences between the two genera has been the configuration of the lips and whether or not they have a corona of setae. This means of differentiation has apparently been abandoned, as there are species in both genera with differing lip configurations and with or without lip setae. The presence or absence of chela finger teeth has been used as a differentiating character, but there are known species in both genera with and without chelae teeth. We have placed this new species under *Parapallene* because, in our opinion, it shares more characters with that genus than it does with *Pseudopallene*, according to Stock's (1954: 50, 61) definitions of these genera.

The inverted flexure of the chelifores in this new species is very rare among pycnogonids and is unique among the species of *Parapallene* (and *Pseudopallene*).

The adults of this new species have an apparent wrinkle artifact anterior to the oviger implantation on the neck.

Distribution

Known only from the type locality, off Zululand in 550 m.

Etymology

The specific name '*invertichelata*' refers to the inverted flexion of the chelifores present in all specimens examined.

Genus *Pseudopallene* Wilson, 1878

Pseudopallene gilchristi Flynn, 1928

Pseudopallene gilchristi Flynn, 1928: 23–25, fig. 13a–c. Barnard, 1954: 107. Stock, 1968: 39, fig. 14e–g.

Material

Transkei area. SAM–A10254, SM 226, 710–775 m, 1 larvigerous ♂.

Remarks

This male specimen agrees well with the original description and figure 13b of Flynn's male, in regard to the proboscis shape and lip fringe, the chelae, legs and ovigers. The few small differences involve the expected variation in oviger spine counts and differences in measurement of various long segments. The claw measures 0,7 of the propodus length and there are no auxiliaries present. Despite the depth at which this specimen was dredged, the low, rounded ocular tubercle bears well-pigmented eyes.

Distribution

This record apparently marks only the third capture of this species and its range, from so few records, is restricted to the Indian Ocean from Transkei and Port Natal to Lourenço Marques, from 'tow net' depth to the present record of 710–775 m.

Safropallene gen. nov.*Diagnosis*

Trunk elongate, completely segmented. Neck present, with oviger implantation at midlength. Lateral processes well separated, without adornment. Chelifores extremely elongate, scape one-segmented, chelae with many teeth. Palps lacking entirely. Proboscis straight, cylindrical, without protruding lips. Oviger long, slender, 10-segmented, strigilis with denticulate spines and serrate terminal claw. Legs very slender, elongate, with few very long spines. Cement-gland pore(s) not evident. Propodus without heel or long sole spines, claw long, without auxiliaries.

Type species: Safropallene longimana sp. nov.

Etymology

The name is an anagram derived from the area of origin, southern Africa, and 'pallene', the suffix used for most genera of this family. Gender feminine.

Remarks

This new genus joins 22 others in this broad-based but fairly homogeneous family. In the latest key to the family (Child 1982a: 24–25), *Safropallene* can be traced to couplet 14, where it joins *Seguapallene* in the list of characters. This latter genus differs from *Safropallene* in its much shorter, more normal appearing trunk and appendage lengths, and in the presence of auxiliary claws on the two known species.

Safropallene longimana sp. nov.

Fig. 6

Material

Transkei area. Holotype, SAM-A10243, SM 226, 32°28,6'S 28°58,8'E, 710–775 m, 1 ♂. Paratypes, SAM-A10244, 5 ♀♀; SAM-A10245, 4 ♂♂, SAM-A10229, 15 specimens, all SM 226, 710–775 m. Paratypes, USNM 216760, SM 226, 710–775 m, 2 ♂♂, 2 ♀♀.

Durban area. Paratypes, SAM-A10246, SM 129, 30°53,4'S 30°31,7'E, 850 m, 18 ♂♂, ♀♀. Paratypes, MNHN-Py 599, SM 129, 850 m, 2 ♂♂, 2 ♀♀.

Description

Male. Moderately small, extremely tenuous, leg span 12,3 mm. Trunk fully segmented, slender, with moderately long neck bearing oviger implantation bulges at midlength, armed with two small anterolateral knobs at chelifore insertion. Lateral processes separated by more than twice their diameters, about twice their diameters in length, without adornment. Ocular tubercle low, broad-based, with small unpigmented eyes, situated at anterior of cephalic segment.

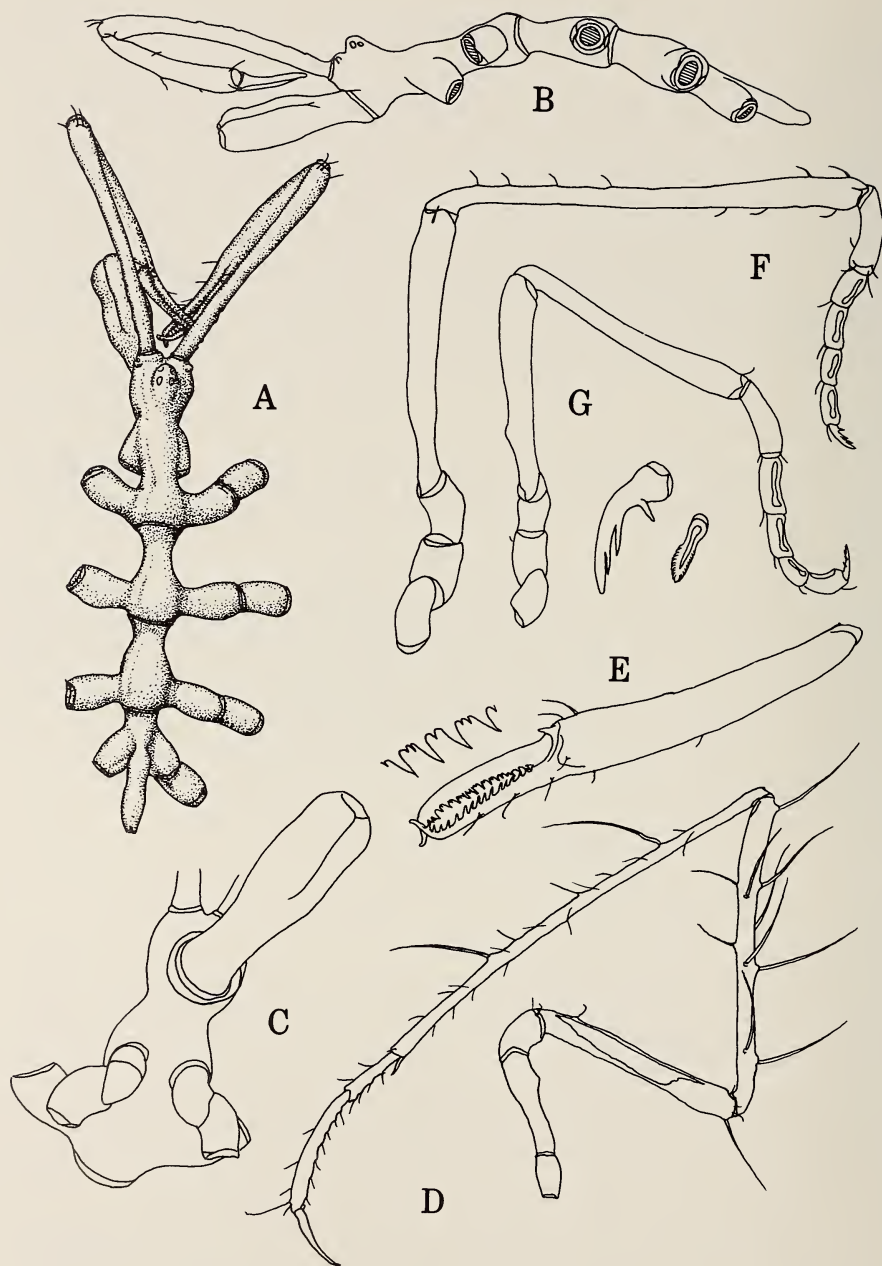


Fig. 6. *Safropallene longimana* gen. et sp. nov. A-F. Holotype, male. A. Trunk, dorsal view. B. Trunk, lateral view. C. Trunk anterior, ventral view. D. Third leg. E. Chela, with enlargements of teeth. F. Oviger. G. Paratype, female. Oviger with enlargements of denticulate spine and terminal claw.

Proboscis fairly short, cylindrical, slightly swollen distally, lips rounded. Abdomen moderately long, sausage-shaped, glabrous, extending to distal rim of first coxae of fourth legs.

Chelifores scapes almost twice proboscis length, armed with few distal setae not longer than scape diameter. Chelae as long as scapes, carried folded inward above proboscis, cylindrical, slightly curved. Fingers 0,3 of chela length, crossing at tips, armed with 15 large teeth on immovable finger and 12–13 on movable finger, teeth separated by gaps holding one or two very small teeth in each. Chela armed at insertion of movable finger with small slender tubercle and few setae mostly distally and ectally on immovable finger.

Palps entirely lacking.

Oviger very long, slender, fifth segment over 14 times longer than maximum diameter, fourth segment measuring 0,6 length of fifth. Sixth segment short, curved; it and fifth armed with few setae. Strigilis segments subequal, each armed with ectal seta and endal denticulate spines in the formula 8 : 6 : 5 : 6. Spines with smooth proximal edges, distal edges closely serrate. Terminal claw shorter than tenth segment, well curved, armed with three large endal teeth.

Legs very slender, long, major segments armed with few very long spines, some over five times segment diameter. Femoral cement gland a long dark mass 0,6 as long as segment length, pores or tubes not evident. Tarsus slender, 0,6 propodal length, armed with few dorsal and ventral setae. Propodus slightly curved, without heel, armed with few dorsal setae, a very long dorsodistal spine, seven or eight short sole spines. Claw almost 0,5 propodal length, well curved, auxiliaries lacking.

Female. Oviger fourth and fifth segments much shorter, almost equal in length. Strigilis segments with denticulate spines in the formula 8 : 6 : 4 : 7, with three teeth on the claw. Femur dilated only proximally in gravid specimens.

Measurements (holotype, in mm)

Trunk length, 1,57; trunk width (2nd lateral processes), 0,59; proboscis length, 0,6; abdomen, 0,36; third leg—coxa 1, 0,18; coxa 2, 0,5; coxa 3, 0,24; femur, 0,91; tibia 1, 1,25; tibia 2, 1,7; tarsus, 0,28; propodus, 0,54; claw, 0,24.

Remarks

This new species has several attributes found in the genus *Nymphon*, such as the generally slender habitus, the oviger implantation, the heavily armed chelae, and the long slender legs without auxiliary claws, but the total lack of palps removes it from consideration in that genus. There is, to our knowledge, no other known pycnogonid with such long chelifores that, when extended, measure over four times the length of the proboscis.

Distribution

Known from Transkei and Durban areas with a bathymetric range of 710–850 m.

Etymology

The specific name *longimana* alludes to the very long characteristic chelifores.

Family **Pycnogonidae** Wilson, 1878

Genus *Pycnogonum* Brünnich, 1764

Pycnogonum (Nulloviger) africanum Calman, 1938

Pycnogonum africanum Calman, 1938: 163–165, fig. 10A–C.

Pycnogonum (Nulloviger) africanum Stock, 1968: 61, fig. 22A–B.

Material

East London area. SAM–A10250, SM 162, 630 m, 1 ♂.

Transkei area. SAM–A10251, SM 232, 620–560 m, 1 ♀.

Remarks

Stock (1968: 61) created the subgenus *Nulloviger* to accomodate *P. africanum* and several other species without ovigers in the male, and this is confirmed by the *Meiring Naude* male. This specimen (SAM–A10250), while lacking ovigers, is a male due to the placement of the sex pores, but fits Calman's (1938) female paratype better than his female holotype. It has lateral processes devoid of the three tubercles, having only a single large conical one, and the ocular tubercle is produced into a tall acute spine with four distinct but unpigmented eyes. The three median pointed tubercles have some sparse short spines. First coxae of each leg have two low posterior tubercles, second coxae with only an integument of large granules, and third coxae devoid of ornamentation. The male femur is distally produced into a shorter anterior and a longer posterior tubercle, the first tibia has two subequal prominences, and the second tibia has a brush of equal and very short spines over its ventrodistal third, which is continued over the sole of the tarsus and propodus. The reticulation is usually inconspicuous, as stated by Calman, but the integument is granular with one short spine on some of the granules.

Some measurements (in mm) of the *Meiring Naude* male are: trunk from anterior of cephalic segment to base of abdomen, 5,22; proboscis, 3,44; and abdomen, 1,46.

The female from station SM 232 is much larger than the male of SM 162. Some of the female's measurements (in mm) are: trunk, 4,59; proboscis, 6,31; and abdomen, 1,15. The proboscis in the female is long and styliform and is 0,33 longer than the trunk. The female specimen is also more tuberculate with three stout anterior-projecting median trunk tubercles which, like most of the integument, are granular, of an uneven size, and bear a few short setae or spines.

The male sexual pore is quite visible on the posteroventral face of the second coxae on the fourth legs. The female legs are slightly larger than those of

the male, but are otherwise similar. The differences between characters of the male and female, as noticed by Stock (1968) are confirmed by these two specimens.

Distribution

This species was known from off Zanzibar and Lourenço Marques in 183–1 228 m, and the above records extend its distribution further south in the Indian Ocean.

Pycnogonum crassirostrum Sars, 1888

Pycnogonum crassirostre Sars, 1888: 340; 1891: 12, pl. 1 (fig. 1A–H). Hedgpeth, 1948: 279, fig. 52B [literature]. Stock, 1966: 402 [key].

Pycnogonum crassirostrum: Stock, 1975: 1086–1087, fig. 59e.

Material

Transkei area. SAM–A10255, SM 232, 620–560 m, 1 ♂ juv.

Remarks

This small subadult specimen agrees more closely with *Pycnogonum crassirostrum* than with the similar *P. guyanae* Stock. It has the small rounded median dorsal tubercle on the fourth trunk segment, the median dorsal trunk tubercles are smooth (but granular), tibia 2 is slender, and the tarsus and propodus have a dense ventral cover of spinules, bifurcate at their tips. The oviger has eight segments although it is not fully formed (the ultimate segment is a knob without the claw) in this juvenile, the ocular tubercle is short, broad, and has four well-pigmented eyes, and it is shorter than the three anterior median trunk tubercles. Stock (1975: 1086–1087) remarked on the resemblances or similarities between these *P. crassirostrum* and *P. guyanae*, but the differences appear to be sufficient to keep the two separate.

Distribution

This species has been taken from water ranging from 100–400 m deep off Iceland, Greenland, Norway, and eastern North America, and is thus a moderately deep, cold-water form. It is surprising to find it in South African waters, but less so if the cold capture depth is considered.

Pycnogonum forte Flynn, 1928

Pycnogonum forte Flynn, 1928: 31–33, figs 18, 19. Barnard, 1954: 152–153, fig. 31C–D. Stock, 1966: 402 [key].

Material

East London area. SAM–A10249, SM 185, 90 m, 1 ♀.

Transkei area. SAM–A10248, SM 226, 710–775 m, 1 ♀, 1 juv.

Remarks

Neither the females nor the juvenile specimen shed any light on the question of relationship between this species and *Pycnogonum cataphractum* Möbius (1902: 194, pl. 30 (fig. 11)). The specimen figured by Möbius is a male, for which he indicated the absence of ovigers despite its bearing eggs. Flynn (1928) figured a female of *P. forte*, as did Barnard with a second specimen. The above three specimens appear from the scant literature to be the third and fourth captures of this species, but still the male is either unknown or is the more tuberculate *P. cataphractum* as figured by Möbius. The male in many genera of pycnogonids is the more spinose, tubercular or setose of the two sexes, so the more tubercular male specimen figured by Möbius may possibly be the male of this species. However, some *Pycnogonum* species—such as *P. africanum*, *P. anovigerum*, *P. cataphractum*, and possibly others known from females only—lack ovigers in the male, so we cannot be sure until a male with eggs is taken. The female status of these two adult specimens was confirmed by finding a barely distinguishable genital pore on the posterior surface of the second coxae of the fourth legs in both specimens (none on the second coxae of the other legs), and groups of tiny eggs in a dissected leg of the specimen from SM 226. Therefore, the presence or absence of an oviger in the male of this species remains unknown.

The mid-dorsal trunk tubercles are apparently variable. Both Flynn (1928) and Barnard (1954) illustrated a rather pronounced tubercle between the ocular tubercle and the posterior tubercle of the cephalic segment. The corresponding tubercle on the females of this collection is a low mound composed of many papillae arranged on bumps all over the mound. The distal ends of all tubercles on the trunk and legs are very papillose. The propodal sole has only a few short pointed spines and none of the blunt bifurcate spines found on some *Pycnogonum* species.

Distribution

This species has been collected previously off the Gneka River near Port Elizabeth and off Great Fish Point. Only one depth, 90 m (49 fathoms), has been recorded in the literature, so the above records greatly extend the known depth range to 775 m, and confirm that it is an endemic South Africa species.

Pycnogonum nodulosum Dohrn, 1881

Pycnogonum nodulosum Dohrn, 1881: 203–207, pl. 16 (figs 1–3). Loman, 1928: 62, 64. Fage, 1953: 381 [list]. Barnard, 1955: 106. Stock, 1958a: 5; 1966: 401 [key]. Arnaud, 1987: 50, table 1.

Material

Zululand area. SAM–A10253, SM 86, 550 m, 2 ♀♀.

Transkei area. SAM–A10224, SM 250, 150–200 m, 3 ♀♀.

Remarks

These five females are fully adult with sexual pores opening on the postero-lateral side of fourth leg, second coxae. Their length ranges from 3,5 mm to 3,97 mm and width across the second lateral processes from 1,03 mm to 1,15 mm, sizes comparable with the Mediterranean specimens (Arnaud 1987: 50). The largest female (SM 86) is 3,97 mm long and bears three strong almost columnar dorsal tubercles, larger than in the specimens from SM 250.

Distribution

This species was previously recorded from South Africa by Barnard (1955: 106), who listed a specimen from Algoa Bay in 9 m. It has also been found occasionally in places between its type locality in the Mediterranean and Morocco (Loman 1928), occidental Africa (Fage 1953) and South Africa. Its above occurrence off the Zululand and Transkei coasts is in deeper waters than previous records, which are as shallow as 9 m. Another female specimen was taken by the University of Cape Town Ecological Survey in Saldanha Bay, at station SB306T (33°03,7'S 17°58,5') in 20 m, on 30 April 1963, on fine sand.

Family *Colossendeidae* Hoek, 1881

Genus *Hedgpethia* Turpaeva, 1973

Hedgpethia magnirostris sp. nov.

Fig. 7

Material

Zululand area. Holotype, SAM-19579, SM 103, 28°31,7'S 32°34,0'E, 680 m, 1 ♂. Paratype, SAM-A19580, SM 103, 680 m, 1 ♀.

Description

Male. Size small for this genus, leg span about 34 mm. Trunk completely segmented, with suture or separation lines crossing each segment. Each segment posteriorly flaring, decreasing in size towards posterior. Lateral processes extremely short, not as long as their diameters, separated by slightly less than their diameters, armed with one dorsodistal seta or glabrous. Cephalic segment narrow anteriorly, with small dorsolateral knob above palp insertion. Ocular tubercle low, conical, as tall as basal diameter, eyes indistinct, unpigmented. Abdomen extremely short, reaching to just beyond posterior lateral processes, carried obliquely ventrally, glabrous.

Proboscis extremely large, 1,7 times length of trunk, proximally slender, inflating gradually to very swollen midpoint, tapering less gradually to slender distal portion and small lips. Curved slightly downward in lateral view.

Palp third segment longest, slender, curved, fourth segment short, fifth almost 0,6 length of third, sixth shortest, distal four segments almost subequal, all armed with short setae, more numerous ventrodistally.

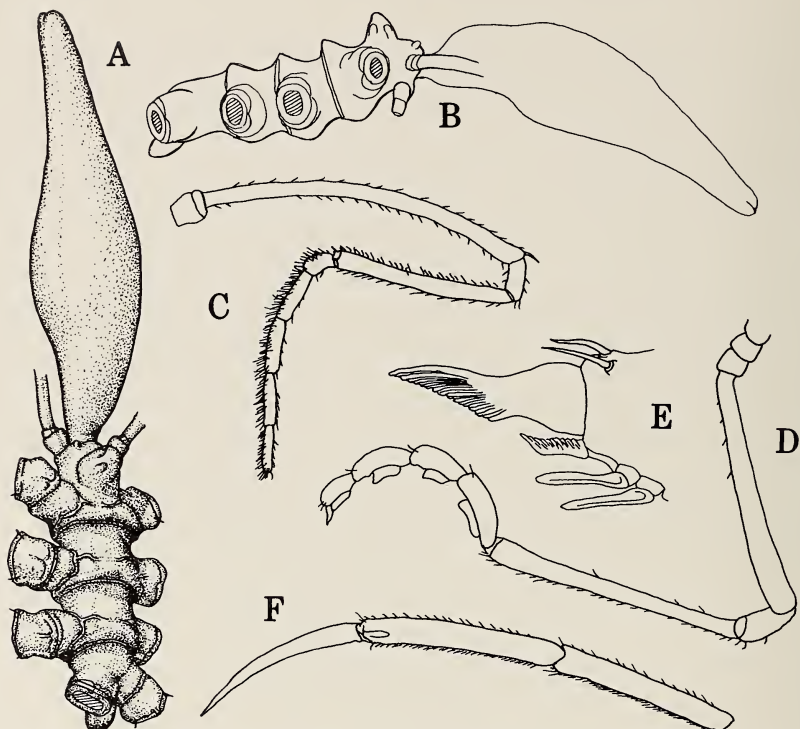


Fig. 7. *Hedgpethia magnirostris* sp. nov. Holotype, male. A. Trunk, dorsal view. B. Trunk, lateral view. C. Palp. D. Oviger. E. Oviger terminal segment and claw. F. Third leg, terminal segments.

Oviger fourth and sixth segments subequal, sixth armed with row of short ectal setae. Strigilis four segments, increasingly short, armed with single ecto-distal seta and row of spatulate endal spines. Terminal segment armed with comb-like terminal spine forming subchela with terminal claw. Claw broad, bottle-shaped with denticulate comb distally forming acute angle with tip.

Legs long, slender, armed with very short setae and few equally short spines growing more numerous distally. Femur curved proximally, straight distally. Tibia 2 only 0,64 length of tibia 1, femur 0,68 length of tibia 1. Tarsus slightly shorter than propodus, both armed with very short sole setae, fewer short ectal setae. Claw robust, well curved, equal in length to tarsus.

Female. Slightly larger in all measurements except for main oviger segments. Femorae slightly inflated proximally with ova.

Measurements (holotype, in mm)

Trunk length, 2,0; trunk width, 0,73; proboscis length, 3,36; third leg—coxa 1, 0,4; coxa 2, 0,5; coxa 3, 0,5; femur, 3,4; tibia 1, 5,0; tibia 2, 3,2; tarsus, 1,2; propodus, 1,3; claw, 1,2.

Remarks

For a genus hitherto containing only eight known species, *Hedgpethia* presents some problems to the taxonomist because the species are closely similar. This new species differs from the eight known species by having a proboscis much larger in proportion to the trunk than in any other species, and a shorter ocular tubercle with indistinct eyes.

This species is most closely related to *H. californica* (Hedgpeth, 1939), and *H. bicornis* (Turpaeva, 1958) (previously under the 'articulatus-group' (Loman, 1908)—lacking a proboscis tooth—of the genus *Rhopalorhynchus*). It differs from these two in having a longer first tibia, thus making the leg segment ratios different. It has a femur measuring only 0,68 the length of tibia 1, whereas the femur is 0,82 of the first tibia in *H. californica* and is 0,8 in this ratio for *H. bicornis*. The tarsus is shorter than the propodus ($T = 0,92$ of P) in *H. magnirostris*, whereas it is equal to or longer than the propodus in *H. californica* and *H. bicornis*.

The main difference, besides greater proboscis size in the new species, is in the ocular tubercle, which is a low truncate cone without a pointed apex, whereas *H. californica* and *H. bicornis* both have a tall pointed ocular tubercle. The eyes of both species are large and well pigmented, whereas those of the new species are very indistinct and lack pigmentation. Both *Meiring Naude* specimens agree in this character.

The new species shares with *H. bicornis* two small anterolateral cephalic segment tubercles, which are not present in *H. californica*. But, *H. bicornis* has middorsal trunk tubercles, whereas the other two have cowl or ridges that lack these tubercles. The palps of *H. californica* have 'a few scattered setae on the terminal segments' (Hedgpeth 1939: 460), whereas the palps of the other two species are heavily setose on the terminal segments.

Distribution

Since the new species has been taken at a single station and depth, nothing can be deduced about its distribution.

Etymology

The specific name is from the Latin *magnus* and *rostrum*, meaning a large snout or beak, pertaining to the larger than usual proboscis of these specimens.

Hedgpethia sp. indet.

Material

Transkei area. SAM-A19585, SM 226, 710–775 m, 1 juv.

Remarks

This specimen has similarities with the species described above, but is too juvenile for positive identification.

Genus *Rhopalorhynchus* Wood-Mason, 1873*Rhopalorhynchus gracillimus* Carpenter, 1907

Rhopalorhynchus gracillimus Carpenter, 1907: 99–100, pl. 13 (figs 25–32) [all except Saya de Malha record].

Rhopalorhynchus kröyeri: Loman, 1908: 26–27 [only Siboga sta. 310 specimen]. Calman, 1923: 268–270 [part]. Barnard, 1954: 88–89, fig. 2.

Rhopalorhynchus gracillimum: Stock, 1958b: 128–132, figs 39–56.

Material

East London area. SAM–A19598, SM 164, 90 m, 1 ♀.

Remarks

This longitarsal specimen agrees in most characters with Carpenter's (1907) description and particularly with Stock's (1958b) figures 52–56. The ratio of tarsus–propodus–claw to tibia 2 length is 0,72 to 1, well within the lower end of Stock's ratio figures of 0,7 : 1 to 1 : 1. The claw is slightly shorter than half the propodal length.

The one character of the present material not in keeping with the previous descriptions of this species is the form of the distal palp. The palp segments of this female are notably shorter than in any figures of the palp given for the species, and much shorter than those of the type specimen. The distal four segments are only slightly longer than their diameters, whereas the sixth segment is about twice as long as its diameter. The shortness of the distal segments on both palps may be due to regeneration or some other factor, and we feel that other specimens from this locality should be examined before deciding whether or not this character is variable in the species or if the East London material is attributable to another species.

Distribution

This specimen adds nothing new to the known distribution of the species, which has been recorded from the East Indies and Maldiv Islands to the east coast of South Africa, in depths from 0 m to 156 m.

Family **Nymphonidae** Wilson, 1878

Genus *Nymphon* J. C. Fabricius, 1794

Nymphon barnardi sp. nov.

Fig. 8

Material

Transkei area. Holotype, SAM–A10261, SM 250, 31°59,3'S 29°22,5'E, 150–200 m, 1 ♀. Paratype, SAM–A10262, SM 250, 150–200 m, 1 ♀.

Description

Female. Moderately small size, leg span 26,3 mm. Trunk completely segmented, glabrous, without tubercles. Lateral processes short, hardly longer than their diameter, separated by half or slightly more of their diameters, glabrous. Neck short, oviger implantation bulges touching first lateral processes. Ocular tubercle not taller than wide, sides bulging, with tiny apical papilla, eyes large, slightly pigmented. Proboscis moderately short, cylindrical, inflated slightly at midlength, lips rounded. Abdomen cylindrical, tapering distally, reaching slightly beyond posterior lateral processes, glabrous.

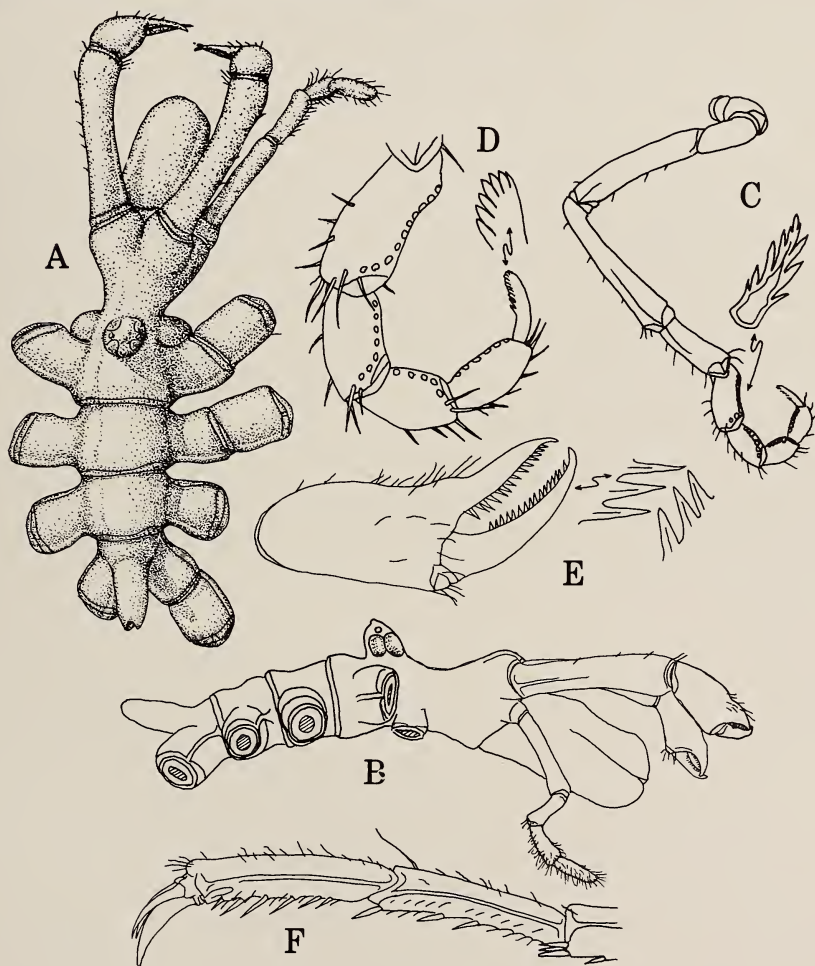


Fig. 8. *Nymphon barnardi* sp. nov. Holotype, female. A. Trunk, dorsal view. B. Trunk, lateral view. C. Oviger, with enlargement of denticulate spine. D. Strigilis, with enlargement of terminal claw. E. Chela, with enlargement of teeth. F. Third leg, terminal segments.

Chelifores typical, scapes as long as proboscis, armed with few lateral and distal setae. Chelae moderately short, palm slightly longer than fingers, armed with few short distal setae. Fingers slightly curved, overlapping at tips, armed with 15 equal-sized teeth on immovable finger and 16 similar or slightly smaller teeth on movable finger.

Palp segment 2 longest, third through fifth subequal, fairly short, armed with many short ventral and distal setae.

Oviger fairly short, third segment slightly shorter than fourth, both with few setae. Sixth segment half length of fifth, armed with few setae. Strigilis segments progressively smaller distally, armed with few ectal setae, and a row of denticulate spines in the formula 10 : 7 : 5 : 6; spines with four or five serrations per side. Terminal claw shorter than terminal segment, moderately curved, with row of eleven serrations extending around and forming part of the tip of claw.

Legs long, moderately slender, armed with short setae increasing in numbers distally. Tibia 2 the longest segment, followed by tibia 1, then the femur. Tarsus slightly longer than propodus on first pair of legs, slightly shorter than propodus on posterior three pairs of legs. Tarsus and propodus armed with few short dorsal setae, a row of lateral setae and several sole spines with short setae between each. Claw robust, moderately curved, about 0,4 length of propodus, auxiliaries about 0,85 length of main claw.

Measurements (holotype, in mm)

Trunk length, 2,56; trunk width (across 2nd lateral processes), 1,39; proboscis length, 1,15; abdomen, 0,44; third leg—coxa 1, 0,5; coxa 2, 0,72; coxa 3, 0,4; femur, 2,38; tibia 1, 2,78; tibia 2, 3,95; tarsus (first leg), 0,62; propodus (first leg), 0,58; tarsus (third leg), 0,7; propodus (third leg), 0,74; claw, 0,29.

Remarks

This new species is closest to another small South African endemic species, *N. crenatiunguis*. The general habitus of the two is very similar, but the differences are more than superficial. The chelae fingers are shorter and have more teeth in *N. crenatiunguis*, and the third palp segment is much longer than the short fourth and fifth segments. The ovigers of the two species are quite similar, including the claw serrations that continue around the tip in a fan shape, but the denticulate spines of *N. crenatiunguis* have three lateral lobes per side, whereas the new species has spines with four or five narrower lobes. The femur is slightly longer than the first tibia in *N. crenatiunguis* (femur shorter than tibia 1 in *N. barnardi*), and in *N. crenatiunguis* the tarsus and propodus have many more sole spines and shorter auxiliaries than in the new species. The tarsus is shorter than the propodus in all legs we examined in *N. crenatiunguis*, but is slightly longer than the propodus on the first pair of legs in the new species. We believe

these differences are sufficient to warrant creation of a new species for these two females.

Distribution

This species is only known from one station, at a depth of 150–200 m.

Etymology

This species is named for Keppel H. Barnard (1887–1964) of the South African Museum, whose contributions to the literature have greatly enriched our knowledge of South African pycnogonids.

Nymphon bicornum sp. nov.

Fig. 9

Material

Zululand area. Holotype, SAM-A19577, SM 60, 27°09,6'S 32°58,2'E, 800–810 m, 1 ♂.

Durban area. Paratypes, SAM-A19578, SM 129, 30°53,4'S 30°31,7'E, 850 m, 2 ♀♀, 2 larvae.

Description

Of a small slender size, leg span 13,9 mm. Trunk long, slender, fully segmented, including base of abdomen. Lateral processes separated by 1,5 to twice their diameters, moderately short, slightly longer to 1,5 times as long as their diameters, glabrous. Neck long, semicylindrical, slightly inflated at midpoint with oviger bulges and ocular tubercle both well anterior to first lateral processes. Ocular tubercle a low anterior-pointing cone with two moderately large lateral sensory papillae, without trace of eyes. Proboscis of moderate size, cylindrical, constricted just behind anterior tip, lips rounded. Abdomen short, cylindrical, constricted distally, with two distal setae.

Chelifores robust, scape slightly longer than proboscis, with a dorsodistal seta. Chela longer than scape, slender, palm shorter than fingers, glabrous. Fingers straight to gently curving distally and overlapping, armed with 40 small curved teeth on immovable finger and 41 similar teeth on movable finger. The immovable finger also bears several short setae.

Palp second segment longest, third 0,75 length of second, fourth half length of third, fifth slightly longer than fourth, terminal three segments armed with distal and ventral setae, some slightly longer than segment diameter.

Oviger fourth segment with ectal bulge proximally, segment 0,75 as long as fifth, which is armed with ectal and endal rows of short setae. Sixth segment slightly curved, half as long as fourth, armed with ectal and endal setae same as fifth segment. Strigilis segments subequal in length, armed with two or three ectal setae, endal denticulate spines in the formula 6 : 4 : 3 : 5, spines with spatulate centre lobe flanked by two serrations per side. Terminal claw shorter

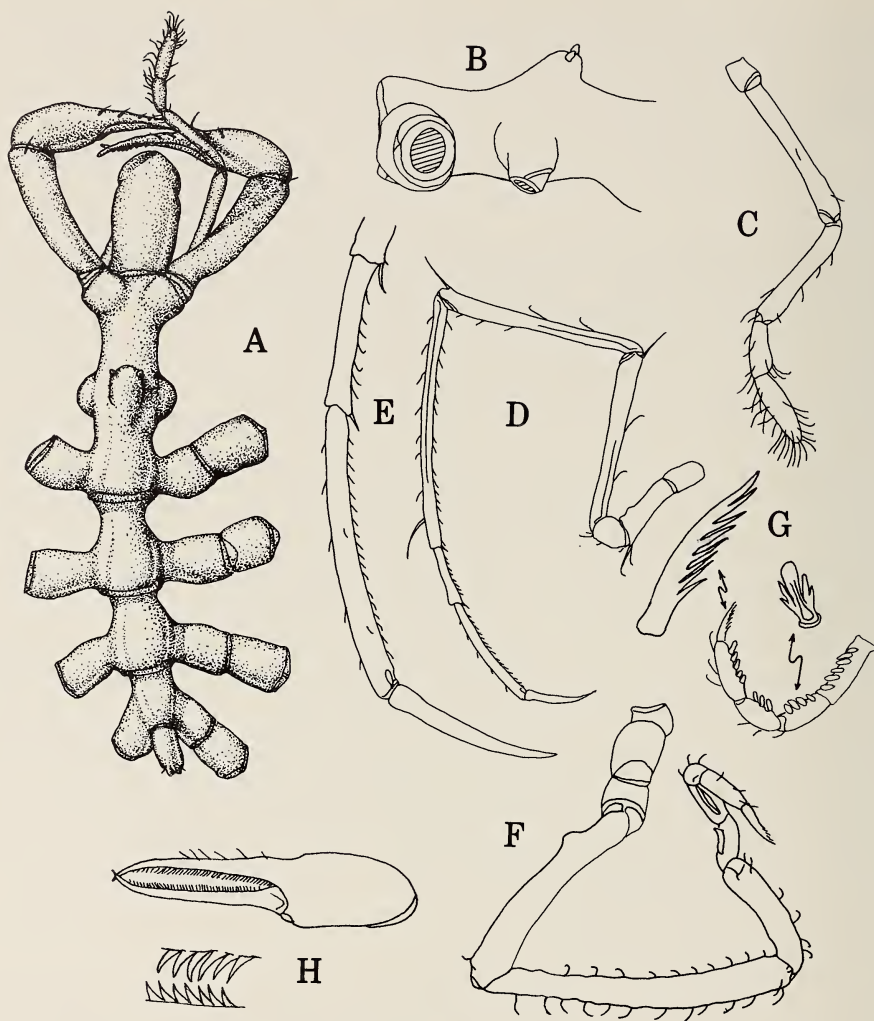


Fig. 9. *Nymphon bicornum* sp. nov. Holotype, male. A. Trunk, dorsal view. B. Part of anterior trunk segment, lateral view. C. Palp. D. Third leg. E. Distal segments of third leg. F. Oviger. G. Strigilis, with enlargements of denticulate spine and terminal claw. H. Chela, with enlargement of teeth.

than ultimate segment, slightly curved, armed with seven endal serrations not including pointed tip.

Legs slender, tibia 2 the longest segment, major segments each armed with few short dorsal and ventral setae and single long dorsodistal seta. Tarsus slightly over half propodus length, both armed with row of short sole spines and propodus with few lateral and dorsal setae. Claw robust, slightly curved, 0,6 as long as propodus, auxiliaries lacking.

Measurements (holotype, in mm)

Trunk length, 1,82; trunk width (across 2nd lateral processes), 0,78; proboscis length, 0,6; third leg—coxa 1, 0,26; coxa 2, 0,48; coxa 3, 0,24; femur, 1,14; tibia 1, 1,3; tibia 2, 1,58; tarsus, 0,4; propodus, 0,73; claw, 0,43.

Remarks

This new species appears to be most closely related to a deeper-water species found in both the North and South Atlantic and Pacific oceans, *N. procerum* Hoek, 1881. Both have a long neck with the ocular tubercle and oviger bases implanted well forward of the first lateral processes, and have a similar long tenuous appearance. Both lack auxiliary claws and have long chelae fingers with 40 or more teeth in each. The differences are in the longer neck, much longer palp segments, longer chelae fingers with longer teeth, longer proboscis and abdomen, and longer setae on the legs of *N. procerum*. The legs and ovigers of the two species are very much alike, except that the oviger of *N. procerum* has a terminal claw with about 20 fine teeth, instead of the seven or eight found in the new species.

Distribution

The new species is known only from Natal and Zululand in 800–810 m and 850 m depths, whereas the depths known for *N. procerum* are much deeper, including specimens from a trawl in over 6 000 m.

Etymology

The species name *bicornum* means two-lobed or two-horned and refers to the two fairly large sensory papillae found on the ocular tubercle.

Nymphon comes Flynn, 1928

Nymphon comes Flynn, 1928: 14–16, figs 4–6. Barnard, 1954: 92–93, figs 3, 5C. Stock, 1956: 78–79, fig. 3; 1962: 282; 1965: 21–23 [list, text].

Nymphon affinis Stock, 1951: 5–7, figs 1–6. Barnard, 1954: 94.

Nymphon affine: Stock, 1965: 21–23 [list, text].

Material

East London area. SAM–A19612, SM 179, 80 m, 1 ♀.

Transkei area. SAM–A19611, SM 233, 540–580 m, 1 ♂.

Remarks

Both of these fairly large specimens agree in most characters with descriptions of both *Nymphon comes* and *N. affine*. Their differences lie in appendage segment lengths, numbers of chela finger teeth, and oviger spine counts, all of which can be attributed to variation within the species. The character that separated the two species, prior to our decision to unite them under *N. comes*, was the presence or absence of alternating small and large teeth on the chelae

fingers. Both of these specimens have alternating large and small teeth, sometimes with two short teeth instead of one between two successive long teeth, in agreement with Barnard's (1954) figure 5c of specimens he listed as *N. comes*. Since these have the alternating teeth and *N. affine* shares this character (Stock 1951: 6, fig. 3), we have united the two species under the senior synonym. Flynn's type specimen is not located at the South African Museum and is unavailable at the moment for examination.

Distribution

This handsome species is another that has been found only along the South African coasts and, although it has been taken in as shallow as 15 m (Stock's type specimen), the specimen from SM 233 was taken in 540–580 m, giving it a rather wide depth range on the shelf and slope.

Nymphon crenatiunguis Barnard, 1946

Nymphon crenatiunguis Barnard, 1946: 60; 1954: 101–102, fig. 7.

Material

East London area. Syntypes SAM–A10137, *Pieter Faure*, P.F. 907, 85 fm (155 m), 1 ♂, 1 ♀. SAM–A19609, *Meiring Naude*, SM 179, 80 m, 1 ♂.

Transkei area. SAM–A19610, SM 250, 150–200 m, 1 ♀.

Remarks

This apparently rare species is recorded in new material here only for the second time. Barnard (1946, 1954) treated the same specimens—the types and one other doubtful specimen. Through the courtesy of the South African Museum, we have been permitted to examine the type series deposited in that Museum.

There are several slight differences between the *Meiring Naude* material and the type specimens. There are several more finger teeth on the SM 179 male chelae (20 and 26), whereas the syntype male has 17 and 22, and both rows of teeth appear more like the pointed ovals figured in Barnard's (1954, fig. 7a) enlargement of the movable finger teeth. The strigilis spine count is 10 : 8 : 6 : 7 in the SM 179 male and there is a total of about five more spines on the female strigilis. The tarsus is slightly shorter than that of the syntypes and the sole spines on the propodus are fairly robust but of a single size. There are five cement-gland openings protruding as low knobs ventrally on the femorae, whereas the syntype male has either four or five per femur, the presence of which add to the ease of recognition in this species.

Distribution

Barnard's types were taken in 155 m, whereas the two *Meiring Naude* specimens are from 80 m and 150–200 m, respectively. The distribution of this species is extended north-east to Port St Johns in the Transkei area.

Nymphon distensum Möbius, 1902

Nymphon distensum Möbius, 1902: 179–180, pl. 25 (figs 1–6). Loman, 1923: 14 [key]. Flynn, 1928: 10–11. Gordon, 1932a: 105–106, fig. 6; 1932b: 28–29, [table], 35 [key]; 1944: 20 [key]. Barnard, 1954: 98–100, fig. 5b.

Material

East London area. SAM–A10026, *Pieter Faure*, P.F. 12840, 17 mi SSW of Buffalo River, trawled, 357 m, 2 ♂♂. SAM–A19600, *Meiring Naude*, SM 179, 80 m, 1 ovigerous ♂. SAM–A19601, SM 185, 90 m, 2 ♀♀, 3 juvs. MNHN–Py 594, SM 185, 1 ovig. ♂.

Zululand area. SAM–A19602, SM 86, 550 m, 1 ♂, 2 ♀♀. USNM 228135, SM 86, 550 m, 1 ♂.

Transkei area. SAM–A19599, SM 232, 620–560 m, 1 ♂.

Remarks

The male from SM 232 has 38 teeth on the immovable chela finger and about 50 teeth on the movable finger, whereas most specimens in the literature have from 60 to 70 and 30 to 33 teeth, respectively. The third leg tarsus is 0,85 as long as the propodus and the claw is 0,4 of that segment, differing slightly from published figures. The strigilis has somewhat fewer denticulate spines than in those described by Barnard (1954: 98). The formula is 12 : 8 : 8 : 8, with 9 spines on the claw. Other than for these slight differences, the specimen from SM 232 and the others, including the *Pieter Faure* specimens, differ very little from the type.

Distribution

Widely distributed from south of Cape Point to Zululand region, between 80 m and 560 m.

Nymphon granulatum sp. nov.

Fig. 10

Material

Transkei area. Holotype, SAM–A10230, SM 226, 32°28,6'S 28°58,8'E, 710–775 m, 1 ♂. Paratypes, SAM–A10232, SM 226, 710–775 m, 2 ♀♀. Paratype, MNHN–Py 597, SM 226, 710–775 m, 1 ♂. Paratypes, SAM–A10231, SM 232, 32°14,9'S 29°10,4'E, 620–560 m, 1 ♀, 3 larv. Paratypes, SAM–A10235, SM 236, 32°14,3'S 29°11,6'E, 670–660 m, 1 ♀, 1 larv.

Durban area. Paratype, SAM–A10233, SM 129, 30°53,4'S 30°31,7'E, 850 m, 1 ♀.

East London area. Paratypes, SAM–A10234, SM 162, 32°55,0'S 28°31,0'E, 630 m, 2 ♂♂. Paratypes, USNM 228133, SM 162, 630 m, 1 ♂, 1 ♀.

Description

Male. Moderately small, legspan 27,7 mm. Entire surface moderately papillose except proboscis, imparting granular appearance. Trunk anterior fully segmented,

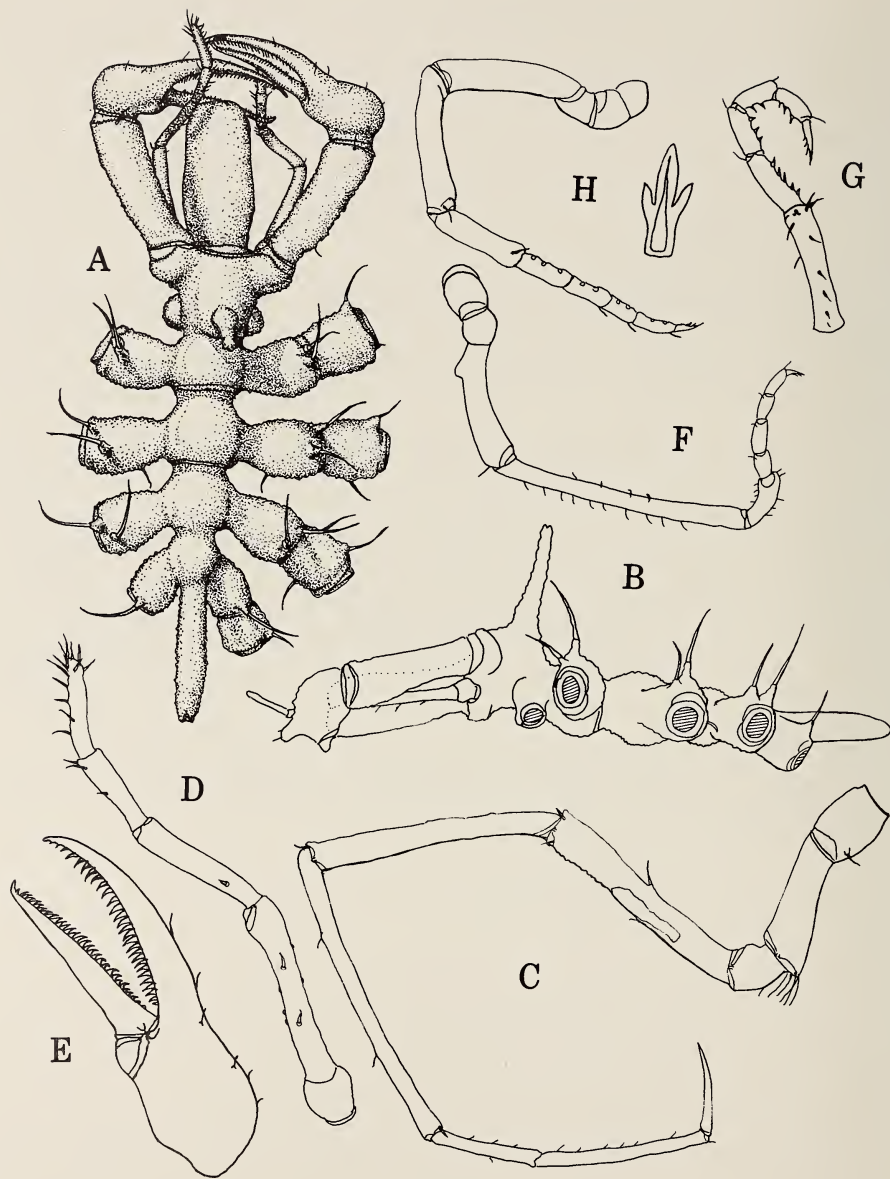


Fig. 10. *Nymphon granulatum* sp. nov. A-G. Holotype, male. A. Trunk, dorsal view. B. Trunk, lateral view. C. Third leg. D. Palp. E. Chela. F. Oviger. G. Strigilis. H. Paratype, female. Oviger, with enlargement of denticulate spine.

posterior third and fourth segmentation line incomplete. Lateral processes robust, separated by about half their diameters, as long as twice their diameters, armed with dorsodistal and slightly laterodistal slender tubercles not as long as segment diameter, capped with slender spine longer than segment diameter. Neck short, expanded anteriorly to oblique angular chelifore insertions. Ovipiger implantation well anterior to first lateral processes, ocular tubercle implanted directly dorsal to ovigers, very tall, columnar, with two tiny papillae at apex, without eyes. Proboscis cylindrical, slightly constricted proximally, lips almost flat. Abdomen long, extending to distal rim of second coxae, fourth legs, glabrous.

Chelifores large, scapes almost as long as proboscis, distal diameter almost equal to proboscis base, armed with one or two lateral and distal setae. Chelae longer than scapes, palm ovoid, shorter than fingers. Immovable finger moderately curved, armed with slightly curved teeth of a similar size. Movable finger straight except for curved tip overlapping immovable finger, armed with 33 smaller curved teeth only half size of those on immovable finger, of slightly different sizes.

Palp moderately slender, second segment longest, third 0,6 as long as second, both armed with few short lateral setae. Fifth segment slightly longer than fourth, combined length only equal to second segment, both distal segments armed with few ventral and distal setae increasing in numbers distally, none longer than segment diameter.

Ovipiger fourth segment with large ectal mound proximally, fifth longest, straight, armed with ectal and endal rows of few setae, without distal apophysis or setae. Sixth segment well curved, armed with few lateral setae. Strigilis segments slender, progressively shorter, armed with ectal seta distally and small denticulate spines in the formula 5 : 3 : 2 : 3; spines broad with single lateral lobes. Claw almost as long as terminal segment, armed with three endal teeth.

Legs slender, long, armed with very few setae or spines. Second coxae with ventrodiscal tuft of setae as long as segment diameter. Femoral cement gland a small sac at midpoint of segment, pore(s) not evident. Tibia 2 the longest segment with tibia 1 and femur each slightly shorter than the last. Tibia 2 armed with stout ventrodiscal spine. Tarsus 0,6 as long as propodus, both armed with very few tiny sole spines. Claw slightly less than half propodal length, almost straight, auxiliaries lacking.

Female. Slightly larger overall than male. Ovipiger segments four and five subequal, glabrous. Strigilis armed with fewer denticulate spines in the formula 3 : 2 : 2 : 2, with three endal teeth on the terminal claw of both female and male. Sexual pores on coxa 2 ventrally on only posterior four legs.

Measurements (holotype in mm)

Trunk length, 3,24; trunk width (across 2nd lateral processes), 2,08; proboscis length, 1,21; abdomen, 1,14; third leg—coxa 1, 0,58; coxa 2, 1,18; coxa 3, 0,54; femur, 2,09; tibia 1, 2,28; tibia 2, 2,86; tarsus, 0,98; propodus, 1,57; claw, 0,74.

Remarks

This new species appears to be most closely related to the West African species *N. mauritanicum* and *N. prolatum*, each having tall columnar ocular tubercles, long abdomens and no auxiliary claws. This species differs from *N. mauritanicum* in its slender lateral-process tubercles bearing long spines instead of broad tubercles bearing many short setae, its longer palps and proboscis, its glabrous abdomen, and the legs that have far fewer setae. The chelifores and ovigers are quite different in the two species.

It differs from *N. prolatum* in its much more robust and crowded general habitus, shorter lateral processes, abdomen and neck, in having tubercles with spines on the lateral processes, and in the chelae finger teeth that are more or less the same size on any one finger instead of being at least two different sizes. The legs, palps, proboscis, and ovigers are very similar in the two species except that the fifth segment of the oviger has a distal apophysis with setae in *N. prolatum*. Eyes are lacking in the new species, whereas both of the West African species have clearly defined eyes.

Distribution

Well established along the east coast of southern Africa, between 620 m and 850 m.

Etymology

The new species name, *granulatum*, refers to the overall granular appearance of the integument.

Nymphon microctenatus Barnard, 1946

Nymphon microctenatus Barnard, 1946: 60; 1954: 95–96, fig. 4. Stock, 1965: 22–23 [list, key].

Material

East London area. Holotype, SAM-A10100, *Pieter Faure*, P.F. 12840, 17 mi SSW of Buffalo River, trawled in 357 m, 23 April 1901, 1 ♀.

Transkei area. SAM-A19594, *Meiring Naude*, SM 237, 600–650 m, 1 gravid ♀.

Remarks

This is apparently only the second specimen of this large and very distinctive species to be recorded. The specimen from SM 237 is from about 100 miles north-east of where the type was taken and is from deeper water.

The chelae teeth are quite distinctive and make this an easily recognized species. They number over 300 on each chela and appear similar to a fine-toothed comb or much like the large propodal lamina found on many species of the genus *Anoplodactylus*. The finger tips cross in the new specimen and may have been broken off in Barnard's type. The terminal palp segment appears even more slender but no more curved than that of Barnard's (1954: 95, fig. 4c)

type, and both the fourth and fifth segments are slightly longer in this specimen. The terminal leg segments appear tiny in comparison to the very long major leg segments. The sole spines of the tarsus and propodus are all of a single size and in a single row. The oviger strigilis has the denticulate spine formula 15 : 11 : 10 : 11, with 16 small teeth on the slender terminal claw. The spines have 5–6 fine serrations on each side.

Nymphon modestum Stock, 1959

Nymphon modestum Stock, 1959: 556–558, fig. 3.

Material

Zululand area. SAM–A19595, SM 86, 550 m, 1 ♂ with eggs. USNM 228136, SM 86, 550 m, 1 ♂.

Transkei area. SAM–A19603, SM 239, 90 m, 1 gravid ♀. SAM–A19604, SM 250, 150–200 m, 2 ♂♂, 1 ♀, 7 juv. and larv. MNHN–Py 596, SM 250, 150–200 m, 1 ♂.

Remarks

We believe these specimens are *N. modestum*, although the variation displayed among these seven adults does not quite agree with the description of the female type. Some differences seem superficial but others assume greater importance among closely related species in the genus *Nymphon*.

The palp third segment is described as being about as long as segment 5 in the type, whereas that of these specimens is variously 0,3 to 0,6 times longer than segment 5. The abdomen varies from shorter than the fourth lateral processes to as long as the distal end of coxa 1. The curved chelae of these specimens are distinctly shorter than the scapes that, in turn, are equal to the proboscis, whereas in the type the chelae are longer than the scapes. The finger teeth vary in number from 17 to 21 on the immovable finger and from 21 to 24 on the movable finger, whereas those of the type number 23 and 27, respectively. Similarly, the oviger strigilis spines number from as many as eight to as few as five.

The tarsus and propodus of these specimens show the greatest differences from those of the type. The tarsus is fully 0,6 as long as the propodus and both are more slender than those of the type. There are usually more sole spines, the proximal heel spine is sometimes absent, and in the males from SM 250, the auxiliary claws are only about 0,4 times as long as the main claw. In most other characters, the variations are sufficiently small to suggest that these specimens are well within the limits described for the type.

The male oviger has not been described before as the type, and only previous record, is a female. The fifth segment is typically elongate, curved, laterally setose, and bears a small distal apophysis with six or seven setae as long as the segment diameter. The strigilis is also more setose and bears spines in the formula 8 : 6 : 5 : 7, with five teeth on the terminal claw. The distal palp segments are more

setose ventrally. In summary, the principal differences are the greater length of the third palp segment and tarsus, and the shorter chelae in relation to the scape in these specimens.

Distribution

The range of this species is extended eastwards from Lambert's Bay in the South Atlantic to the Indian Ocean, from off Lake St Lucia to the Transkei coast, and the known depths are greatly extended from 23 m for the type to 90 m and 550 m by the present specimens.

Nymphon obesum sp. nov.

Fig 11

Material

East London area. Holotype, SAM-A10263, SM 179, 33°30,3'S 27°22,1'E, 80 m, 1 ♀.

Description

Moderately small, leg span 26,7 mm. General habitus robust, stout, appendages crowded. Trunk completely segmented, barrel-shaped. Lateral processes short, thick, only as long as their diameters, separated by very slight intervals to almost touching, glabrous. Neck short, oviger implantation against and below first lateral processes. Ocular tubercle directly above ovigers, short, slightly taller than wide, apex conical with small lateral papillae, eyes large, tear-shaped, slightly pigmented. Proboscis broad, shorter than twice its diameter, cylindrical, lips flat. Abdomen short, carried almost erect, tapering distally, glabrous.

Chelifores large, scape longer than proboscis, downcurved, armed with several dorsal and distal setae. Chela palm longer than fingers, subcylindrical, with few distal setae. Fingers well curved, overlapping at tips, armed with three widely separated teeth on the immovable finger and four like teeth on the movable finger.

Palps small, slender, second segment longest, third slightly shorter, both armed with several setae, mostly distal. Fourth segment slightly shorter than fifth, both with short ventral and distal setae not longer than segment diameter.

Oviger fourth and fifth segments subequal, glabrous, sixth shorter than seventh, with several distal setae. Strigilis segments progressively shorter, armed with several short ectal setae and denticulate spines in the formula 11 : 6 : 5 : 5; with eight small blunt teeth on the short almost straight terminal claw. Spines with three lobes per side.

Leg robust proximally, more slender distally. Main segments with few setae, tibia 2 the longest segment, with tibia 1 and femur progressively shorter. Tarsus very short, 0,33 the length of propodus, armed with ventrodistal spine and few sole setae. Propodus slightly curved, armed with several short ectal setae and five or six sole spines interspersed with short setae. Claw robust,

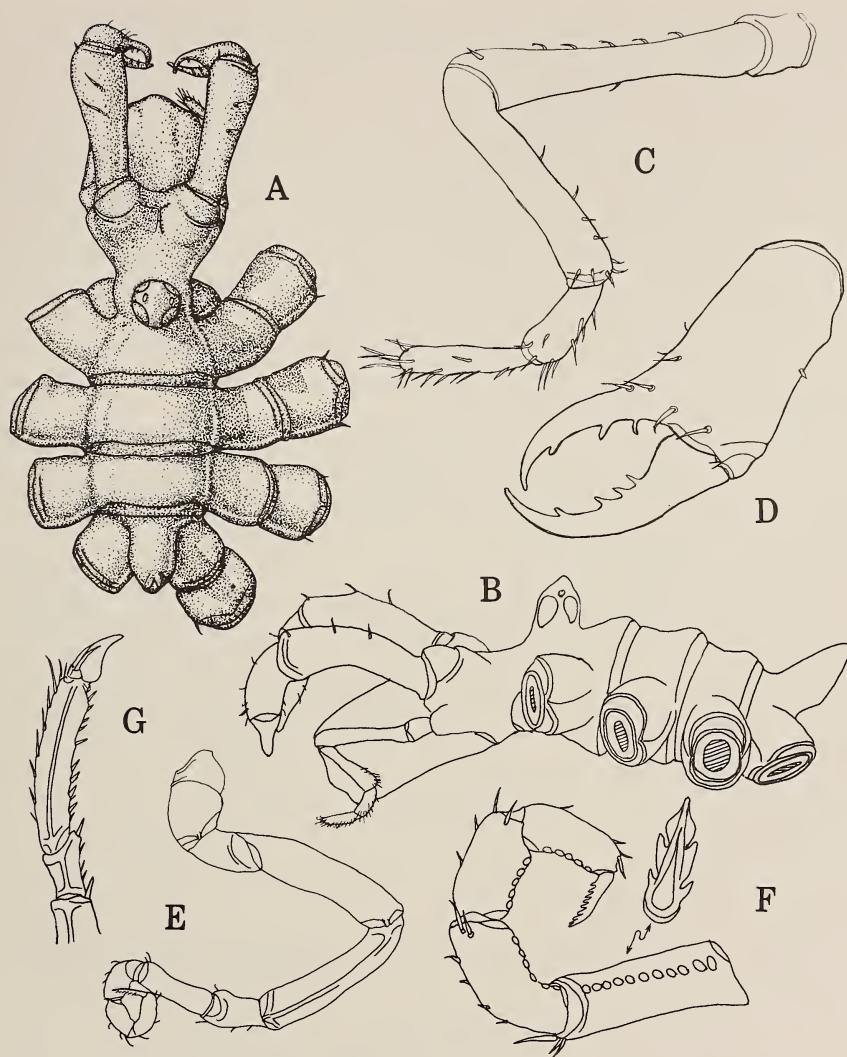


Fig. 11. *Nymphon obesum* sp. nov. Holotype, male. A. Trunk, dorsal view. B. Trunk, lateral view. C. Palp. D. Chela. E. Oviger. F. Strigilis, with enlargement of denticulate spine. G. Third leg, terminal segments.

short, about 0,3 the length of propodus, auxiliaries slender, about 0,6 as long as main claw.

Male unknown.

Measurements (holotype, in mm)

Trunk length, 2,94; trunk width (across 2nd lateral processes), 2,04; proboscis length, 1,32; abdomen, 0,66; third leg—coxa 1, 0,78; coxa 2, 0,88;

coxa 3, 0,76; femur, 2,4; tibia 1, 2,64; tibia 2, 2,92; tarsus, 0,4; propodus, 1,18; claw, 0,37.

Remarks

This new species shares the character of a remarkably 'fat' trunk and proboscis with a number of species previously named under the old junior synonym *Chaetonymphon*, erected by G. O. Sars (1888) to include 'thickset' setose species. Although we have found no closely related South African species at all like *N. obesum*, there are at least two similar North Atlantic species, *N. hirtum* Fabricius, 1794, and *N. hirtipes* Bell, 1853. The new species is probably closest to *N. hirtum* from the high Arctic, except that it is far less setose and has a bald appearance in comparison to *N. hirtum*. The chelae, legs and propodus are quite different in the new species.

Nymphon hirtipes is also a very setose species and, in spite of its similarities of short neck, thickset trunk and lateral processes, and large chelifores, its ovigers, legs, chelae, and palps are very different from those of *N. obesum*.

Distribution

Only known from the type locality, off East London, at 80 m.

Etymology

The species name *obesum* refers to the robust and thickset habitus of this unique specimen.

Nymphon paralobatum sp. nov.

Fig. 12

Material

Transkei area. Holotype, SAM-A19571, SM 226, 32°28,6'S 28°58,8'E, 710-775 m, 1 ♀.

Description

Moderately small, leg span 24,4 mm. Trunk completely segmented, rather slender, lateral processes short, little longer than their diameters, separated by about their diameters, glabrous. Neck short, oviger bases slightly anterior to first lateral processes; ocular tubercle between oviger bases and first lateral processes, short, not as tall as wide, with tiny apical papilla; eyes large, slightly pigmented; lateral papillae present, tiny. Proboscis moderately long, cylindrical, with constriction just proximal to flat lips. Abdomen extending half length of first coxae of fourth legs, tapering distally, armed with few dorsolateral setae.

Chelifores large, scape cylindrical, armed with few lateral and distal setae. Chelae only as long as scapes, palm semicylindrical, armed with scattered short

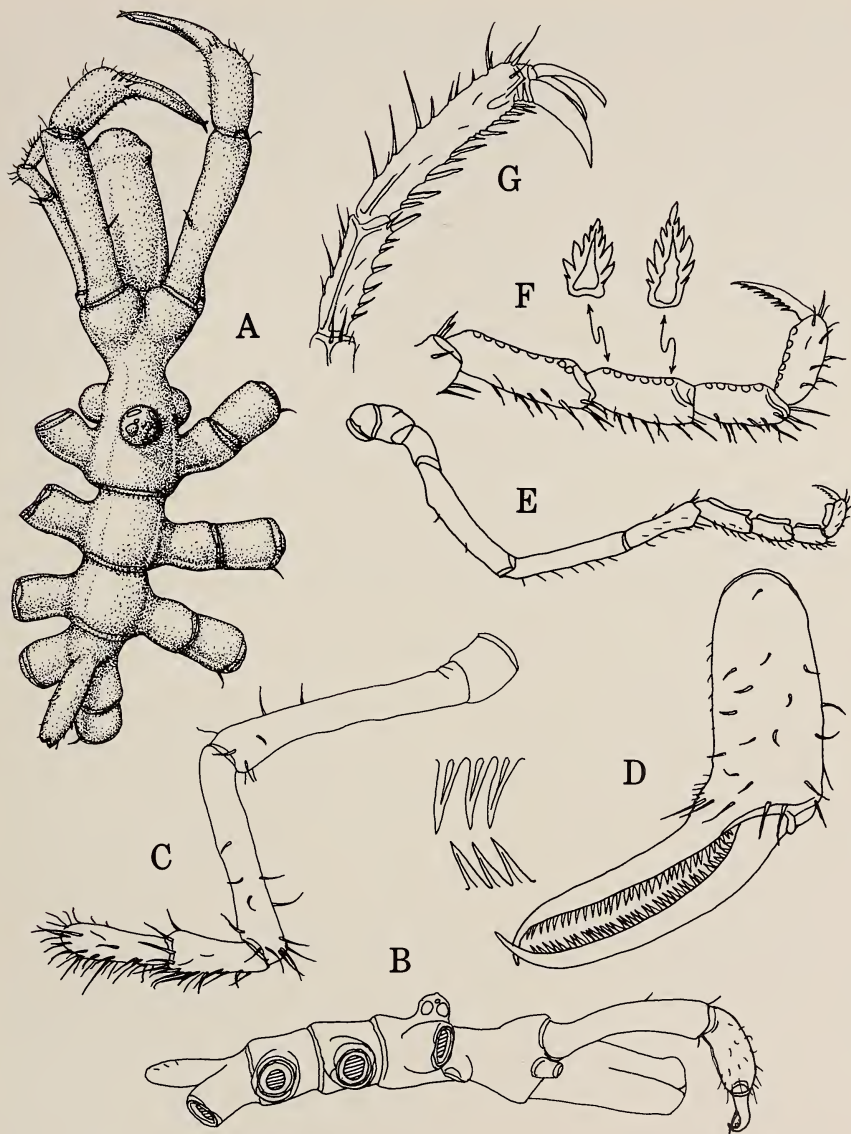


Fig. 12. *Nymphon paralobatum* sp. nov. Holotype, female. A. Trunk, dorsal view. B. Trunk, lateral view. C. Palp. D. Chela, with enlargement of teeth. E. Oviger. F. Strigilis, with enlargements of proximal and distal denticulate spines. G. Third leg, distal segments.

setae. Fingers slender, slightly longer than palm. Movable finger moderately curved, armed with 38 slender straight teeth; immovable finger almost straight, overlapping movable finger at tip, armed with 33 slightly longer straight teeth.

Palps fairly small, second segment only slightly longer than third, both armed with few distal setae. Terminal two segments subequal, together almost as long as third segment, armed with many ventral and distal setae, some longer than segment diameters.

Oviger fourth segment with small proximal bump, length about equal to fifth segment. Sixth segment straight, 0,6 as long as fifth, both armed with row of ectal setae and sixth with short lateral and ventral setae. Strigilis segments armed with few short ectal setae and denticulate spines endally in the formula 8 : 6 : 5 : 6, with eight short teeth on terminal claw as long as tenth segment. Denticulate spines shorter proximally than longer distal spines.

Legs moderately setose, major segments increasingly longer from femur to tibia 2. Tarsus 0,56 as long as propodus, armed with six or seven sole spines, several lateral and dorsal setae not as long as segment diameter. Propodus armed with 10 or 11 sole spines, few lateral setae, and several dorsal setae, some of which are longer than segment diameter. Claw about 0,45 as long as propodus, well curved, auxiliaries about 0,7 as long as main claw.

Male unknown.

Measurements (holotype, in mm)

Trunk length, 2,58; trunk width (across 2nd lateral processes), 1,28; proboscis length, 1,1; abdomen, 0,6; third leg—coxa 1, 0,43; coxa 2, 0,76; coxa 3, 0,38; femur, 1,75; tibia 1, 2,74; tibia 2, 3,84; tarsus, 0,46; propodus, 0,82; claw, 0,36.

Remarks

We hesitate to attribute this single female to a new species, particularly as it has no outstanding or unique characters, but its combination of characters, we feel, goes beyond the extremes of variation that might be found in its near-namesake, *N. lobatum* Stock, 1962. It is also sufficiently different from any other species in the genus to warrant being placed in a new species. This new species is closest to *N. lobatum* in its general trunk habitus, most chelifore characters, the palp, some oviger characters, and the legs in particular. It differs from *N. lobatum* in having a shorter neck, oviger bulges placed in advance of the first lateral processes, longer chelifores in relation to the scapes (about equal), a much shorter second coxa, and a slightly longer tarsus. *Nymphon lobatum* was described from a single male specimen and this new species is a single female, but the differences are mostly non-sexual and sufficiently numerous, we believe, to warrant designating a new species. Another major difference, although of little taxonomic importance, is the size of the two species. In most pycnogonids the female is usually a bit larger than the male in most measurements except the oviger, but this female specimen is smaller in the trunk measurements and has about half the leg span of *N. lobatum* (latter about 51 mm).

This new species also has characters in common with *N. signatum* Möbius, 1902, another presumably endemic South African species. In both the neck is moderately short, the lateral processes are separated by about half their diameters, the chela palm is approximately equal in length to the fingers that overlap at the tips, the palps are similar with the fourth segment being about 0,85 the length of the third, and the tarsus, propodus and claw length ratios are similar. The differences are that, in *N. signatum*, the oviger bases touch the first lateral processes, the ocular tubercle is taller than wide, there are almost twice as many teeth on the immovable finger as there are on the movable finger, and there is a maximum of 43 denticulate spines of the same size on the strigilis segments, whereas in the new species there are only 23 spines, of which the distal spines are taller.

Distribution

Only found at one station, off Transkei coast.

Etymology

The specific name is derived from the prefix *para* meaning a species beyond the designated nomina *Nymphon lobatum*, its closest relation.

Nymphon pedunculatum sp. nov.

Fig. 13

Material

East London area. Holotype, SAM-A19581, SM 163, 33°04,6'S 28°06,6'E, 90 m, 1 ♂ with eggs. Paratype, USNM 228134, SM 163, 90 m, 1 ♂. Paratypes, SAM-A19582, SM 163, 90 m, 2 ♀♀. Paratypes, MNHN-Py 598, SM 164, 1 ♀.

Description

Male. Size small, leg span about 21 mm. Trunk fully segmented, lateral processes 1,5 as long as their diameters, separated by half to less than half their diameters, glabrous. Neck very short, only as long as oviger bases. Ocular tubercle situated directly dorsal to oviger bases, slightly over twice as tall as diameter, arising from constricted base giving pedunculate appearance, eyes large, well pigmented, situated just below biconical apex. Proboscis slightly longer than cephalic segment, cylindrical, with slight constriction distal to mid-point, lips moderately inflated. Abdomen short, erect, extending just beyond distal rims of fourth lateral processes, glabrous.

Chelifores robust, scape almost as long as proboscis, armed with few lateral and distal setae. Chelae approximately as long as scapes, palms little shorter than fingers. Immovable finger only curved distally, overlapping movable finger, armed with fringe of proximal setae, 53 closely set teeth of equal size. Movable finger moderately curved except distally where sharply curved, armed with 56 closely set teeth of equal size, slightly smaller than teeth of immovable finger.

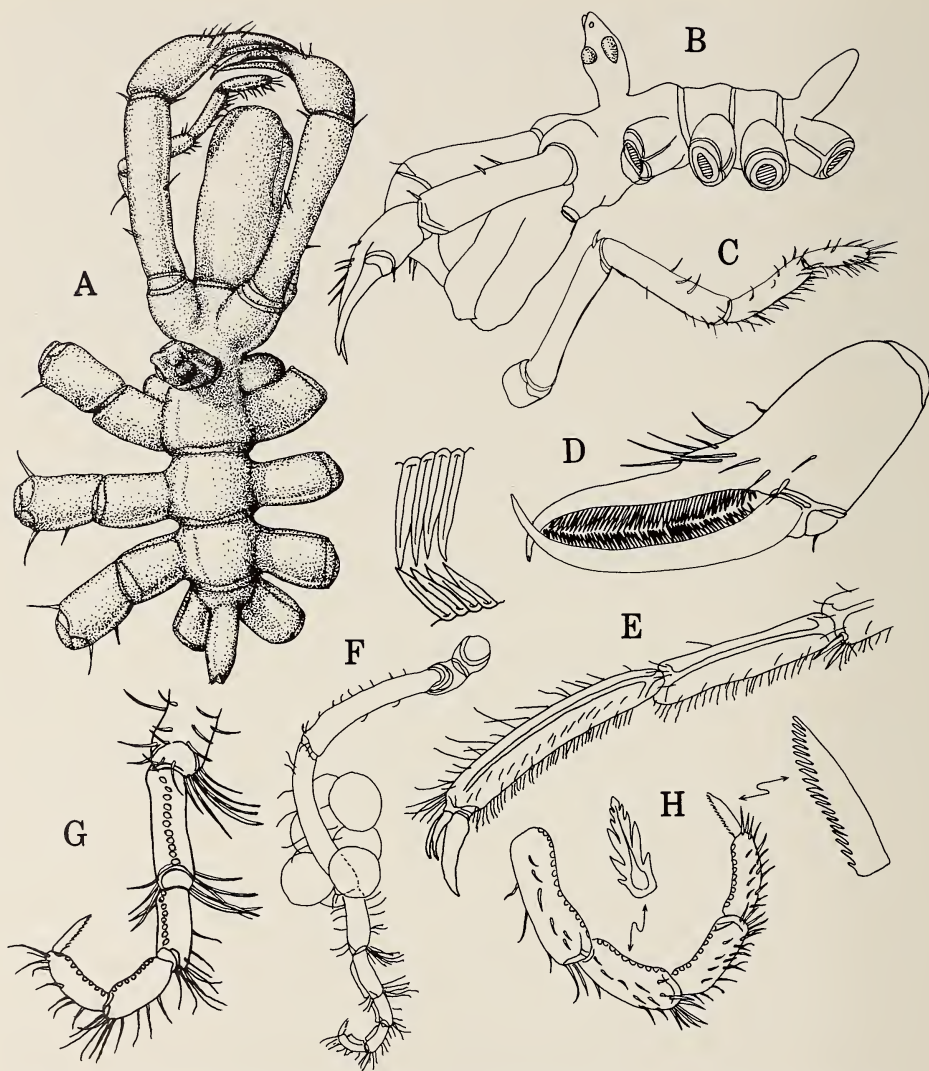


Fig. 13. *Nymphon pedunculatum* sp. nov. A-G. Holotype, male. A. Trunk, dorsal view. B. Trunk, lateral view. C. Palp. D. Chela, with enlargement of teeth. E. Third leg, distal segments. F. Oviger. G. Strigilis. H. Paratype, female. Strigilis, with enlargements of denticulate spine and terminal claw.

Palp segment three subequal to segment two, third armed with few distal setae. Segment five only 0,8 as long as segment four, combined length of both equal to second segment, terminal segments armed with many short lateral and ventral setae, some longer than segment diameter.

Oviger segments four and five subequal, both with row of lateral setae, short on fourth, longer on fifth. Sixth segment slightly curved, 0,3 as long as

fifth, armed with lateral setae and tuft of long distal setae, longer than segment diameter. Strigilis segments progressively shorter in length, armed with ectal tuft of setae longer than segment diameter, and endal denticulate spines in the formula 12 : 8 : 7 : 7; spines slender, with four or five lateral serrations per side. Terminal claw slightly shorter than terminal segment, straight, armed with 17 lobe-like serrations extending to tip.

Major leg segments with few setae, tibia 2 longest with tibia 1 and femur each respectively shorter. Cement-gland pores not evident. Tarsus about 0,85 as long as propodus, both armed with few dorsal setae, numerous short lateral setae and many short sole spines of a single size. Claw 0,3 length of propodus, moderately curved, auxiliaries about 0,6 as long as main claw.

Female. Slightly larger than male except for oviger. Bifurcate ocular tubercle apex also pedunculate, as is base of tubercle. Oviger segments four and five subequal, strigilis segments with fewer setae and all shorter than those of male. Strigilis compound spines in the formula 13 : 10 : 8 : 9, with 18 blunt serrations on terminal claw.

Measurements (holotype, in mm)

Trunk length, 1,99; trunk width (across 2nd lateral processes), 1,16; proboscis length, 1,18; abdomen, 0,4; third leg—coxa 1, 0,41; coxa 2, 0,72; coxa 3, 0,58; femur, 1,91; tibia 1, 2,39; tibia 2, 2,64; tarsus, 0,49; propodus, 0,59; claw, 0,19.

Remarks

This new species is closest to *Nymphon pleodon* Stock, 1962, a South African species not encountered during this survey. It differs from *N. pleodon* in having a taller and pedunculate ocular tubercle, chelae with fingers showing less curvature and having more closely crowded teeth, the palp terminal segment shorter than the fourth, oviger segment six slightly longer than the seventh, terminal claw and denticulate spines of the oviger with a greater number of serrations, femur shorter than tibia 1, and auxiliaries longer than half the main claw length. The new species lacks the strong broad spines on oviger segments five and six of *N. pleodon*.

As stated by Stock (1962: 281), *N. pleodon* resembles *N. gruveli* Bouvier, 1910, as does the new species. The principal differences between the new species and *N. gruveli* are that the latter lacks the pedunculate ocular tubercle, has dorsodistal tubercles on tibia 2 (not found in the new species), and has much shorter auxiliary claws. Also, in Bouvier's species the terminal palp segment is longer than the fourth segment, whereas the opposite is true for the new species.

Distribution

Only found at one station, off East London.

Etymology

The specific name *pedunculatum* is derived from the Latin *pedis*, meaning a foot and refers to the ocular tubercle growing on a narrowed basal part that supports the larger part of the tubercle.

Nymphon phasmatodes Böhm, 1879

Nymphon phasmatodes Böhm, 1879: 173–174, pl. 1 (fig. 2). Flynn, 1928: 4. Loman, 1928: 67, figs 2, 6, 7. Stock, 1956: 76–78, fig. 2; 1959: 558; 1962: 283–284; 1965: 22–23 [key].

Nymphon capense Hodgson, 1908: 169–170, pl. 1 (figs 2, 2A). Gordon, 1932a: 117–120, figs 11–12; 1932b: 28, 32, 34, 62. Barnard, 1954: 91–92.

Material

East London area. SAM–A19605, SM 180, 80 m, 1 ♀. SAM–A19606, SM 185, 90 m, 1 ♀, 1 juv.

Remarks

There are few differences between these three specimens and the previous descriptions and illustrations of *N. phasmatodes*. We regard these differences to be only variation within the species, because most characters in the *Meiring Naude* specimens agree very well with the published figures. The differences are a slightly shorter tarsus for these specimens, the strigilis spine and claw count which vary by one or two spines per segment, and a similar variation in claw teeth, a slightly lower ocular tubercle having rather large lateral papillae, and a shorter tibia 2 which is nevertheless much longer than tibia 1 or the femur. Apparently, the chelifores of this species are carried usually in a distinctive erect position with the chelae extended vertically down to the sides of the mouth. In most *Nymphon* species the chelae are carried in a more horizontal or oblique position.

Distribution

This is another endemic South African species known from relatively shallow depths. Station 185, at 90 m, marks the deepest depth from which this species has been taken.

Nymphon pilosum Möbius, 1902

Nymphon pilosum Möbius, 1902: 179, pl. 24 (fig 8–12). Barnard, 1954: 100–101, fig. 6. Stock, 1956: 76; 1962: 278; 1968: 29.

Nymphon bipunctatum Flynn, 1928: 8–10, figs 1–2.

Material

Zululand area. SAM–A19591, SM 86, 550 m, 6 ♂♂ with eggs, 2 ♂♂, 3 ♀♀, 5 juvs. MNHN–Py 595, SM 86, 550 m, 1 ♂, 1 ♀. SAM–A19593, SM 103, 680 m, 2 ♂♂ with eggs, 1 ♂, 4 gravid ♀♀, 3 juvs. SAM–A19592, SM 129, 850 m, 1 ♂.

Transkei area. SAM-A19590, SM 226, 710–775 m, 1 ♀. SAM-A19589, SM 250, 150–200 m, 1 ♂, 2 ♀♀.

Remarks

This fairly common species is easily recognized among the many South African *Nymphon* species by its extremely long leg setae, some of which are up to five times longer than the segment diameter. As is true for all described *Nymphon* species examined for this report, the appendage measurements of this species vary and assume slightly different ratios among the segments, the oviger strigilis spines vary in number—some with as little as 18 spines, and the number of chelae finger teeth show a reduction in number in some of the above specimens, possibly due to age, but the specimens agree very well in most characters with the specimens previously figured. The cement-gland tube cones on the ventral surface of the femur vary in number from one male with two per leg to several specimens with four or five per femur. This, again, may be a function of age.

Distribution

As far as its distribution is known, this species is confined to South African waters, and was previously recorded over a rather wide depth range from 20 m to 366 m. The depths at which it was taken by the *Meiring Naude* increase the maximum known depth to 850 m.

Nymphon serratidentatum sp. nov.

Fig. 14

Material

Transkei area. Holotype, SAM-A19583, SM 226, 32°28,6'S 28°58,8'E, 710–775 m, 1 subadult ♀. Paratypes, SAM-A19584, SM 226, 710–775 m, 1 ♂ (damaged), 1 juv.

Description

Female. Size moderately small, leg span 27,8 mm. General habitus slender, tenuous. Trunk long, completely segmented, with lateral processes separated by twice their diameters, less than twice as long as their diameters, glabrous. Neck moderately long, triangular in dorsal profile anterior to ocular tubercle and oviger implantation, which are well anterior to first lateral processes in an inflation of the neck. Ocular tubercle low, rounded, wider than tall, eyes present, with little pigmentation. Proboscis slender, moderately short, with slight median inflation, lips rounded. Abdomen very short, not extending beyond distal fourth lateral processes, with few dorsodistal setae.

Chelifores large, scape 1,2 times longer than proboscis, glabrous. Chelae slightly longer than scapes, curved inward, palm less than half length of fingers, with few short distal setae. Fingers very slender, slightly curved, overlapping at

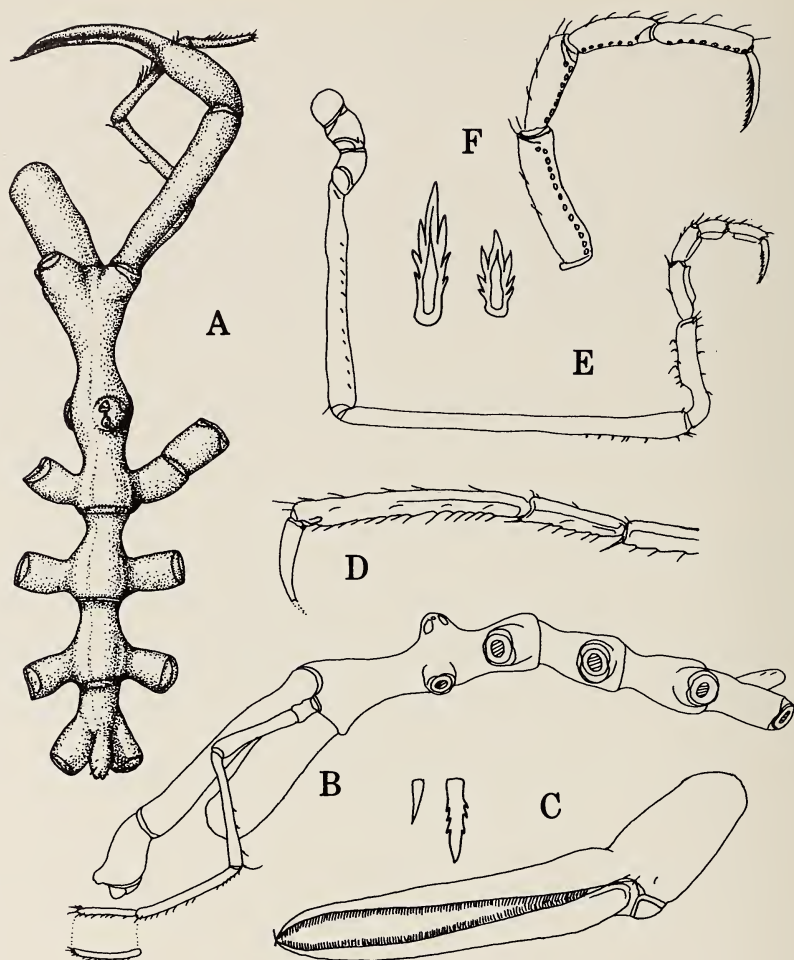


Fig. 14. *Nymphon serratidentatum* sp. nov. Holotype, female. A. Trunk, dorsal view. B. Trunk, lateral view. C. Chela, with enlargements of teeth. D. Third leg, terminal segments. E. Ovipositor. F. Strigilis, with enlargements of denticulate spines.

tips, armed with very many closely crowded narrow teeth, numbering 95 on immovable finger, 118 on movable finger. Some proximal teeth on movable finger with finely serrate edges with two to four tiny serrations per margin. No serrate teeth on immovable finger, plain spine-like teeth on both fingers distally. Finger tips slightly curled laterally.

Palps long, tenuous, third segment longest, 1.3 times longer than second, fourth almost as long as third, fifth segment shorter, half as long as third, with slight endal curve. Third to fifth segments armed with few very short ventral and distal setae.

Ovigers broken off and missing beyond second and fourth segments, respectively.

Legs long, slender, tibia 2 longest with first tibia 0,6 as long and femur 0,43 as long, armed with few short setae and long dorsodistal seta over three times longer than segment diameter of each segment. Tarsus slightly over 0,4 as long as propodus, both armed with few short dorsal and lateral setae, six equal sole spines on tarsus and 16 or 17 equal sole spines on propodus, none longer than segment diameter. Claw about 0,3 as long as propodus (claw tip broken off), auxiliary claws lacking.

Male. Slightly smaller in all measurements except oviger segments. Fifth oviger segment very long, slender, 1,5 times length of fourth, slightly swollen distally, both armed with few short lateral setae. Sixth segment about half as long as fourth, with strong proximal curve separated from distal straight section by small lateral tubercle, armed with lateral and distal setae. Strigilis segments progressively shorter in length, slender, armed with few ectal setae not as long as segment diameter and endal denticulate spines in single row in the formula 13 : 8 : 7 : 8, with slender terminal claw, slightly curved, not as long as terminal segment and armed with 13 short endal teeth. Denticulate spines shorter on proximal part of segments, longer on distal parts, with three slender serrations per side.

Palp segment lengths differ from female with fourth segment slightly longer than second, and third 0,87 as long as fourth. Terminal segment, presumably curved, missing.

Measurements (holotype, in mm)

Trunk length, 4,61; trunk width (across 2nd lateral processes), 1,62; proboscis length, 1,62; abdomen, 0,52; third leg—coxa 1, 0,38; coxa 2, 0,99; coxa 3, 0,42; femur, 2,11; tibia 1, 3,01; tibia 2, 4,99; tarsus, 0,38; propodus, 0,84; claw, 0,3 (? broken off).

Remarks

This new species is very like *Nymphon microctenatus* Barnard, 1946, in many characters. For purposes of comparison, the type of Barnard's species was examined and found, among other differences, to be about three times larger than these specimens. The major differences are in the chelae teeth, which number about 213 in the new species and over 300 in Barnard's species, the much longer neck, the anterior placement of the oviger bases and ocular tubercle in the new species, the much less stout trunk and lateral processes that are separated by much greater distances than in Barnard's species, the strongly curved chelae finger tips which overlap in the new species, and the tarsus which is much shorter than the propodus in the new species.

The striking similarities between the two species are the great number of chelae finger teeth, the extreme similarity of the palp segments in length, and the curve of the fifth or terminal segment, the separation of the oviger bases

from the first lateral processes in both, and the relative measurements of leg, oviger and chelifore segments.

Unfortunately, the holotype female of the new species has only one complete leg and the adult male paratype is entirely without legs. We believe the differences between these specimens and Barnard's type of *N. microctenatus* go beyond variation within a species. However, if subsequent specimens are taken that are intermediate between these specimens and Barnard's type then, of course, the present specimens must be included in his species.

There are some similarities in the new species with *N. prolatum* Fage, 1942, a slender species found in West Africa. The general habitus of both species is similar, except for the ocular tubercle, abdomen and lateral process, which are very much longer than those of *N. serratidentatum*.

The presence of several serrate teeth among the otherwise simple curved teeth on the movable finger of these specimens is, so far we can discern from the literature, unique among the many species of *Nymphon*. The chelae teeth of *N. microctenatus* are very difficult to see separately in their crowded state, but none of the proximal teeth has any serrations in the type specimen.

Distribution

Species only found at one station off the Transkei coast at 710–775 m.

Etymology

The species name *serratidentatum* refers to the uniquely serrate chelae finger teeth of this new species.

Nymphon sp. indet.

Material

East London area. SAM-A19586, SM 185, 90 m, 1 juv.

Transkei area. SAM-A19587, SM 250, 150–200 m, 1 juv.

Remarks

Neither of these juveniles is sufficiently developed to describe or compare with other *Nymphon* species from the above two stations.

DISTRIBUTION AND ZOOGEOGRAPHY

The South African Museum's *Meiring Naude* cruises comprise a set of collections made between the southern Mozambique border and just south of East London, South Africa, and represent the only modern survey of deeper waters along this coast. Of the 92 benthic stations made during the annual cruises from 1975 through 1979, samples from only 21 (21,7%) of these stations contained pycnogonids. No pycnogonids were taken during the first cruise, but methods

improved subsequently and greater numbers appeared in the samples as the cruises advanced. The number of specimens (455, of which 253 were of one species) and the small number of stations do not permit us to draw reliable conclusions concerning distribution.

A few brief comments can be made about the *Meiring Naude* collections with regard to the families represented, depth distribution, geographical boundaries, and associated fauna. The majority of pycnogonid species recorded in these collections belong in three families, while other families are represented by very few or even no specimens. This situation is different to a deeper-water collection reported on by Stock (1963) from South Africa, where the predominant family was the Colossendeidae with six species. Stock's (1981) deep Walvis Basin records again emphasized the Colossendeidae (3 species) and two other families also prevalent in the *Meiring Naude* material—Nymphonidae (4 species) and Austrodecidae (2 new species). The Nymphonidae dominate the *Meiring Naude* material with 14 species (7 new to science), and most of them are from the continental slope. Half the species of this family reported on herein occur in shelf depths of less than 100 m (with some distributions extending well beyond 100 m), whereas the remaining seven species are found between 100 m and 850 m; no specimens were taken between 850 m and 1 300 m.

Another very well-represented group in this material is the family Callipallendidae, with 10 species (3 new). It is also represented by the most genera (six), including the new genus *Safropallene*.

The family Ammotheidae is represented by five known species with one of them, *Boehmia tuberosa*, a relatively rare genus and species. A surprise is the appearance of new material of *Ammothella setacea*, taken only for the second time and redescribed here due to the loss of the type material. It is the most common pycnogonid taken in this survey, with captures at nine stations in continental shelf and slope depths of 90 m to 900 m. Indeed, the 253 specimens of *A. setacea* comprise over 55 per cent of the entire collection.

The family Pycnogonidae is represented here by four species, all from bathyal depths, but *Pycnogonum forte* and *P. nodulosum* are also known from shallower depths along the South African coast or in other parts of the Atlantic and Mediterranean.

There were only two *Meiring Naude* stations as deep as 1 000 m to 1 300 m, so the fact that no species of the genus *Colossendeis* (family Colossendeidae) was captured is inconclusive. There is evidence (Stock 1963) that these species live in deeper habitats off the South African coast. This family is represented in the collections by smaller-sized genera: *Rhopalorhynchus gracillimus* in relatively shallow depths, and *Hedgpethia magnirostris* in bathyal depths.

The genus *Pantopipetta* (family Austrodecidae) is represented by two new species, adding to the six species already known from southern African waters (including two from the Walvis Basin). Of the twelve known species, South Africa seems to be a point of speciation for this genus, although not all six South African species are endemic. The genus is a predominantly deep-water one, but

at least two species (one South African) have been taken in depths as shallow as 66–69 m.

The family Phoxichilidiidae, a predominantly warm, shallow-water group, is represented here by only one species, *Anoplodactylus typhlops*, a true deep-water blind form. The genera *Endeis* and *Phoxichilidium* were not recorded at the depths sampled by the *Meiring Naude*, but at least two species of *Endeis* are known from shallower waters of the South African coast—*E. clipeatus* (Möbius, 1902) and *E. mollis* (Carpenter, 1894) (Barnard 1954: 129–132).

Tiny specimens of the genus *Rhynchothorax* (family Rhynchothoracidae) have yet to be found in South African waters.

We can distinguish three groups of species in the *Meiring Naude* material, according to their depth range. There is a continental shelf and slope component (c. 90 m to 200 m) composed of *Ascorhynchus ornatum*, *Tanystylum thermophilum*, *Rhopalorhynchus gracillimus*, *Nymphon barnardi*, *N. crenatiunguis*, *N. obesum*, *N. pedunculatum* and *N. phasmatodes*. A bathyal element, represented by four species, occurring below 500 m, includes *Nymphon granulatum*, *N. microctenatus*, *N. pilosum* and *N. serratidentatum*. A group of eurybathic species, which may be found at shallow as well as bathyal depths, includes *Ammothella setacea*, *Cilunculus sewelli*, *Pycnogonum nodulosum*, *Nymphon distensum* and *N. modestum*.

The major trends in geographical distribution of southern African littoral pycnogonids are sufficiently documented in the previous literature (Möbius 1902; Barnard 1954; Stock 1959, 1963), but the *Meiring Naude* material, obtained mostly from depths below 500 m, improves our knowledge of the deeper-water species. There are now approximately 100 species recognized from the entire area of southern Africa, south of 20°S (Arnaud & Bamber 1987: 71, table 14). Among the deep-water species of the *Meiring Naude* material, an Atlantic component of five species may be recognized: *Pallenopsis longirostris*, *Pycnogonum crassirostre*, *P. nodulosum*, *Callipallene phantoma*, and *Anoplodactylus typhlops*. There is also an Indo-Pacific element of four species: *Cilunculus sewelli*, *Pseudopallene gilchristi*, *Pycnogonum africanum* and *Rhopalorhynchus gracillimus*. *Pycnogonum forte*, *N. crenatiunguis* and *N. microctenatus* are among the large endemic element of southern Africa. Other endemics are: *Ammothella setacea*, *Ascorhynchus ornatum*, *Boehmia tuberosa*, *Tanystylum thermophilum*, *Pallenopsis capensis*, *Parapallene algoae*, *Nymphon distensum*, *N. modestum*, *N. phasmatodes*, *N. pilosum* and *N. signatum*.

There is a true deep-water component of apparently blind species, all of which are described as new in this report. These are: *Nymphon bicornum*, *N. granulatum*, *N. serratidentatum*, *N. paralobatum*, *Pantopipetta armata*, *Hedgpeithia magnirostris* and *Safropallene longimana*.

There is an absence of any Antarctic component, even at bathyal depths of 1 000 m to 1 300 m, in the *Meiring Naude* material. Several boundaries between the different parts of the very long coasts of southern Africa have been recognized (Branch & Branch 1981). The cold Benguela Current delimits a cold-

temperate zone on the west coast, from Cape Town at 33°56'S north to 20°S latitude. A warm-temperate zone occurs from Cape Point to East London (33°S 27°54'E), a subtropical east-coast zone north from East London to Inhambane (23°51'S 30°30'E), and a tropical east-coast zone from north of Inhambane to Beira (20°S 35°E). With the *Meiring Naude* specimens, the Atlantic component corresponds with the cold-temperate zone, the endemic component mostly agrees with the warm-temperate zone of the south coast, and the Indo-Pacific component corresponds with the subtropical east-coast zone.

Comparisons of the *Meiring Naude* material with that of other abyssal surveys along the South African coasts is, unfortunately, mostly inconclusive. The six abyssal stations studied by Stock (1963) between 2 700 m and 3 000 m reveal a very different type of pycnogonid fauna in these deeper waters of the west coast of South Africa (off Cape Town and the Cape Peninsula). He found 12 species (six of which were new) belonging to five genera. These were one *Nymphon*, one *Ascorhynchus*, six *Colossendeis*, one *Anoplodactylus* and three species of *Pantopipetta*. This fauna may not be considered as truly South African, but rather as a partly cosmopolitan fauna (Atlantic and Indo-Pacific) for the six *Colossendeis* species, and a partly deep-sea Atlantic fauna. This deep-water Atlantic and Cosmopolitan composition holds for Stock's (1981) paper on the pycnogonids from the Walvis (or Cape) Basin in 3 350 m to 5 040 m. There are no affinities with the *Meiring Naude* fauna at these depths and localities, but it does reveal that this Walvis Basin fauna is also partly abyssal cosmopolitan and partly of a deep-water Atlantic component.

Comparison of the *Meiring Naude* pycnogonid stations with stations recorded as having possible prey material in the same catch is somewhat more revealing. It is known that pycnogonids prey on hydroids and there is some evidence that they may also feed on the soft parts of bryozoans (Arnaud & Bamber 1987: 45). We note that at almost all pycnogonid capture stations, hydroids (Millard 1977, 1980) and/or bryozoans (Hayward & Cook 1983) were among the associated fauna brought up at each station.

On the basis of hydroid faunas, Millard (1978) was able to recognize at least nine biogeographic elements but, with the relatively small number of stations containing pycnogonids, we cannot provide such conclusive distribution data, particularly because of the high number (32%) of new species and other rare or little known species.

An attempt was made to see whether or not pycnogonids show a tendency towards greater depths in warmer waters, as Millard (1978: 179) did for hydroids. For example, *Tanystylum thermophilum* was dredged on the west coast at 50–54 m (33°08,6'S 17°57,3'E, sta. WCD203Q, 29 April 1964, unpublished record), and at 17 m and 26–29 m in False Bay on the south coast, but at 150–200 m on the east coast (Transkei, *Meiring Naude*, SM 250). *Pycnogonum nodulosum* has been taken in only 20 m at Saldanha Bay on the west coast (sta. SB306T, 33°03,7'S 17°58,5'E, 30 April 1963, unpublished record), at 9 m on the south coast, but at 150–200 m on the Transkei and 500 m on the Zulu-